BRIDGE BETWEEN BOSTON AND EAST BOSTON.

LETTER

FROM

THE SECRETARY OF THE NAVY,

TRANSMITTING

Report of a commission appointed to examine Boston harbor relative to the construction of a bridge between Boston and East Boston.

JANUARY 5, 1869.—Referred to the Committee on Roads and Canals and ordered to be printed.

NAVY DEPARTMENT,
Washington, January 5, 1869.

SIR: On the 7th day of July, 1868, Congress, by a joint resolution, directed

That the Secretary of the Navy detail two competent and impartial officers of the navy, and the Secretary of War detail a competent and impartial officer of the engineer corps, who shall compose a commission, whose duty it shall be to make careful examination of the harbor of Boston, and shall report to Congress, at its next session, in what manner the commerce of said harbor and the interests of the United States in the navy yard at Charlestown will be affected by the construction of a bridge over the water between the main land in the city of Boston and East Boston, in the manner provided in an act of the legislature of the State of Massachusetts, entitled, "An act to incorporate the Maverick Bridge Company:" and no bridge shall be erected by said company across said water until the assent of Congress shall be given thereto.

In compliance with the foregoing resolution, Rear-Admirals S. H. Stringham and Charles H. Bell were detailed by the Secretary of the Navy, and J. H. Simpson, brevet brigadier general and colonel of engineers United States army, was detailed by the Secretary of War, for the purposes mentioned.

The board thus constituted assembled in the navy yard at Charlestown, Massachusetts, on the 16th of September, and after public notice, and hearing of witnesses on the part of all parties interested who chose to appear, and after a careful examination, the board unanimously and emphatically reported against the erection of the proposed bridge which had been authorized by an act of the legislature of the State of Massachusetts, because the commerce of the harbor of Boston and the interests of the United States would thereby be very seriously and injuriously affected.

The board completed their labors on the 12th of October and adjourned

sine die, but before separating transmitted their report and proceedings to the Secretary of the Navy, by whom they are now respectfully submitted to Congress.

Very respectfully,

GIDEON WELLES,
Secretary of the Navy.

Hon. SCHUYLER COLFAX,
Speaker of the House of Representatives.

NAVY DEPARTMENT,
Washington, September 4, 1868.

SIR: You are hereby detailed as a member of a commission under the joint resolution of Congress, approved July 7, 1868, in relation to the erection of a bridge in Boston harbor, which is in the following words:

Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Navy shall detail two competent and impartial officers of the navy, and the Secretary of War shall detail a competent and impartial officer of the engineer corps, who shall compose a commission, whose duty it shall be to make careful examination of the harbor of Boston, and shall report to Congress at its next session in what manner the commerce of said harbor and the interests of the United States in the navy yard at Charlestown will be affected by the construction of a bridge over the water between the main land in the city of Boston and East Boston in the manner provided in an act of the legislature of the State of Massachusetts, entitled "An act to incorporate the Maverick Bridge Company," and no bridge shall be erected by said company across said water until the assent of Congress shall be given thereto.

The department has detailed as an associate member of the commission Rear-Admiral Charles H. Bell of the navy, and the honorable Secretary of War has named Brevet Brigadier General J. H. Simpson, of the corps of engineers, to serve as a member of the commission.

The commission will meet Wednesday, the 16th instant, at the navy yard, Boston, and you will proceed to that place accordingly.

The commissioners, after completing their examinations and report agreeably to the requirements of the resolution, will forward the report to this department, to be submitted to Congress at its next session.

The commandant at the navy yard will be instructed to afford the commission such facilities as may be at his command to aid them in the discharge of their duties.

The department has notified the Secretary of War of the time and place of meeting of the commission, and has given the necessary orders to Rear-Admiral Bell. It has also given a similar notification to the governor of Massachusetts and to the mayors of Boston, Charlestown, and Chelsea, so that they may have the opportunity of an interview or of communicating with the commission, should they so desire, with regard to the matters referred to in the resolution. You will give them and other parties in interest an opportunity to be heard.

After completing your duties under this order return to your domicile.

Very respectfully,

GIDEON WELLES,
Secretary of the Navy.

Rear-Admiral S. H. STRINGHAM,
United States Navy, Brooklyn, New York.

UNITED STATES NAVY YARD,
Boston, September 16, 1868.

The commission appointed by the honorable Secretaries of the Navy and of War, under the joint resolution of Congress approved July 7, 1868, "in relation to the erection of a bridge in Boston harbor," assembled according to orders at the navy yard, Boston, on this 16th day of September. Present as members of the commission, Rear-Admiral S. H. Stringham, president; Rear-Admiral C. H. Bell and Brevet Brigadier General J. H. Simpson.

The commission proceeded to the consideration of the business before it and read the papers transmitted for its instruction by the honorable Secretary of the Navy, comprising letters from the chairman of the harbor commissioners of Boston, the mayor of Charlestown, and the act of incorporation of the Maverick Bridge Company, with the veto message of the governor of the State of Massachusetts thereon.

The governor of the State was advised that the commission would be in session to-morrow, the 17th instant, as were also the mayors of Boston, Charlestown and Chelsea, and the secretary of the Boston Board of Trade.

At 2 o'clock p. m. the commission adjourned to meet at 10 o'clock to-morrow, the 17th instant.

THURSDAY, *September* 17, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment. Present, Rear-Admiral Stringham, president; Rear-Admiral Bell and Brevet Brigadier General Simpson.

The minutes of yesterday's proceedings were read and the commission organized for business.

It was determined to require from all parties interested in the matter written statements of their reasons for advocating or opposing the proposed bridge—the advocates of the bridge to have the first hearing.

Counsel for the bridge company and its supporters appeared and stated that they were not prepared with their argument, and requested that time might be allowed for its preparation.

A letter was received from Mayor Shurtleff, of Boston, presenting Judge Edwin Wright as his representative. (A.)

The commission consented to give the time requested by the counsel for the bridge company, and accordingly adjourned at 11 o'clock a. m., to reassemble on Monday, the 21st instant, at 10 o'clock a. m.

MONDAY, *September* 21, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment; all the members being present.

The record of the former day's proceedings was read and the commission gave its attention to the business before it.

Counsel for the Maverick Bridge Company appeared and represented that his argument and plans were still incomplete, and requested an extension of time for their preparation, stating that he would be ready to present them on Thursday.

Counsel for the city of Cambridge objected to the granting of the request, arguing that the time which has elapsed since the passage of the act incorporating the bridge company, and the days already allowed them by the commission for preparation, have afforded ample opportunity for the completion of the arguments and plans of the company.

The commission, after due consideration of the matter, consented to

comply with the request of the counsel for the bridge company, upon the assurance that he will be ready at the time specified.

The commission therefore adjourned until 10 o'clock a. m. on Thursday, the 24th instant.

THURSDAY, *September* 24, 1868.

The commission assembled at 10 o'clock a. m., agreeably to adjournment; all the members being present. The record of the former day's proceedings was read, and the doors opened for the public hearing.

Counsel for the bridge company appeared and said that he did not clearly understand what was required by the commission, and was still unprepared to present his case.

He requested to be informed whether the commission designed to confine its inquiries to the requirements of the resolution of Congress, concerning "in what manner the commerce of the harbor of Boston, and the interests of the United States in the navy yard at Charlestown, will be affected by the construction of the proposed bridge; and will not consider the necessity for the bridge arising from the exigencies of industry," &c.

It was replied to this that, at the former hearing, the commission had given the definite statement that its inquiries do not extend beyond questions involved in the resolution of Congress, and that they will be confined to the points therein specified; that what is required from the bridge company are only plans of the location and of the character of the structure of the bridge, with statements of the reasons why it will not interfere with the commerce of the harbor and the interests of the United States in the navy yard.

The gentleman stated that he was still unprepared to furnish these, and asked for a further extension of time.

The room being now cleared, the commission held a private consultation, to determine what course shall be adopted to govern its future proceedings.

It was decided to require that the bridge company shall present their case to-morrow morning, and that it is not considered necessary to present the statements of the bridge company, except in so far as they relate to the location and plans of the proposed bridge, to the attention of its opponents.

The doors were then re-opened and the above decision was communicated to the parties interested.

Counsel for the bridge company agreed to present his case to-morrow.

The commission adjourned at 11½ o'clock, until 10 o'clock a. m. on Friday, the 25th instant.

FRIDAY, *September* 25, 1868.

The commission assembled at 10 o'clock a. m., in accordance with adjournment; all the members being present. The record of the last day's proceedings was read.

Letters from Commissioner J. S. Blake, (Z) and from the Messrs. Gilman, (Y) were received and read; they contained remonstrances against the proposed bridge.

Judge Edwin Wright appeared as counsel for the Maverick Bridge Company, also for Mayor Shurtleff, of Boston, and for the committee on bridges.

He reviewed the act incorporating the bridge company, and directed particular attention to section 4 of said act, limiting the rights and powers of the company.

Concerning the presentation of plans of the bridge, and a statement as to its exact location, he said that the requirements of the commission could not be complied with, inasmuch as the approval of the mayor and aldermen of the city of Boston, in consultation with the harbor commissioners, is necessary under the act to render any plan legally available; that no plan having been so approved, none can, therefore, be furnished to the commission, nor can any definite location for the bridge be pointed out.

He had, however, a plan which was used before the State legislature, in obtaining the act of incorporation of the bridge company, which represents the general characteristics of the proposed bridge. This plan which he presented, (see files C,) he would not have understood to be the one finally determined upon by the bridge company, with the approval of the mayor, &c., as required by the act. The plan was accompanied by a map of the city of Boston and the harbor, upon which is indicated the probable location of the bridge. (B.) The description and specifications of the plan will be ready for presentation on Monday. (D.)

Counsel for property owners of Boston, affected by the erection of the bridge, represented that as the definite location could not be ascertained, all parties interested in the water front are menaced, and requested that he may be allowed time, after the specifications, &c., of their plan is given in by the bridge company, to obtain the necessary evidence for his case, and to prepare his argument in opposition. The commission agreed to allow a reasonable time.

The mayor of the city of Cambridge appeared in behalf of that city and read a remonstrance against the bridge (H;) he also presented a paper (H) signed by many citizens and property owners objecting to the bridge.

Judge Wright, counsel for the bridge company, inquired if he could be furnished with copies of papers presented in opposition to the bridge. The commission reserved its decision upon this point, and will be governed in it by circumstances.

A letter was addressed to Brevet Major General Foster, United States army, in charge of the preservation, &c., of the harbor, asking his views as to the effects upon the harbor of the proposed bridge. (I.)

Awaiting the preparation of the statements of counsel and engineer of the bridge company, which are promised on Monday, the commission adjourned at 12.30 p. m., until Monday, the 28th instant, at 10 o'clock a. m.

MONDAY, *September* 28, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment; all the members being present. The record of the previous day's proceedings was read.

A letter was received from Brevet Major General John G. Foster, United States engineer corps, in charge of the preservation, &c., of Boston harbor, expressing his opinion as to the effect of the erection of the proposed bridge, in reply to the inquiry of the commission conveyed in its letter of the 25th instant, addressed to him. (See file I.)

Mr. Emery, counsel for the bridge company, inquired if the statements of parties coming before the commission are to be read in public, or are to be given in for private use by the commission.

He was informed that all such papers are to be read and presented in open session.

Mr. Emery then read the description of the plan of the bridge laid

before the commission at its last session, prepared by Mr. T. Willis Pratt, engineer of the bridge company. (See file D.)

Mr. Sewell, representing the harbor commissioners of Boston, disputed the authority of Judge Wright to appear for the committee of the board of aldermen of Boston on bridges, to advocate the erection of the bridge. He stated that such authority was given to Judge Wright, in April last, to go before the legislature in the case, but that the authority was exhausted with the occasion.

Mr. Emery, associated with Judge Wright as counsel for the bridge company, &c., stated that Judge Wright had not yet arrived, but would soon be present; and asked that an opportunity might be allowed him to explain personally his position.

The letter from General Foster, with its accompanying papers, before alluded to, (see file I,) were read.

Judge Wright appeared and presented, on behalf of the bridge company, a statement, which he read before the commission, setting forth his arguments in favor of the proposed bridge, and which is to accompany the plan presented on Friday. (See file E.)

Mr. Sewell, on the part of the harbor commissioners, renewed his charge of the absence of proper authority for the appearance of Judge Wright in behalf of the committee of the board of aldermen of Boston on bridges.

In reply, Judge Wright asserted that he was duly authorized to appear as he had done, and would furnish credentials to the fact.

A letter was addressed to Commodore Rodgers, commandant of the navy yard, asking his views relative to the matter under inquiry.

The counsel for the bridge company and its advocates having nothing further to offer at present, and the counsel for its opponents asking until to-morrow to prepare their statements, the commission adjourned at 12 o'clock m., to meet at 10 o'clock a. m. to-morrow, Tuesday, the 29th instant.

TUESDAY, *September* 29, 1868.

The commission assembled at 10 o'clock a. m., in accordance with the adjournment; all the members being present. The record of yesterday's proceedings was read.

Mr. Emery, counsel for the bridge company, begged to remark that the aldermen of Boston, whose committee on bridges was represented yesterday by his associate, Judge Wright, have entire authority in all matters appertaining to bridges, and to conduct all business affecting them.

Mr. Wheildon, counsel for the city of Charlestown, and other remonstrants against the proposed bridge. He urged that the testimony borne against the proposed bridge by the letter of General Foster conveyed the substance of all that could be offered by him. He represented that the interests of the city of Charlestown are general, and not confined to any one particular in this matter; that all of its business and property will be injuriously affected by the building of the bridge.

He read and presented papers objecting to the bridge from the Fitchburg Railroad Company, (J,) and from the Boston and Maine Railroad Company, (K.) He also presented a remonstrance from owners and occupants of wharves in Charlestown, (M,) and a statement from Hon. Thomas Russell, collector of the port of Boston, relative to the commerce of the port. (N.)

Mr. Wheildon asked if a communication had been received from the mayor of Charlestown, and was informed that a copy of such a paper has

been transmitted to the commission by the honorable Secretary of the Navy, to whom it was addressed. The counsel for the bridge company was asked if he desired to hear this paper read, and replied that he did not.

Awaiting the statements of the property owners and others of Boston, opposing the bridge, the commission adjourned at 11.30 o'clock a. m.

WEDNESDAY, *September* 30, 1868.

The commission assembled at 10 o'clock a. m., in accordance with adjournment; all the members being present.

Counsel for the Mystic River Corporation read and presented a remonstrance against the proposed bridge. (O.)

Mr. J. B. Thayer, on behalf of merchants of Boston, read and presented protests from merchants of Boston, (P,) from Tudor Company, (R,) from the Boston Gas Company, (S,) and from Geo. M. Barnard, esq., (T.)

He also presented a copy of the remarks made before the legislature of Massachusetts by Mr. James B. Francis, member of the house committee on harbors, in opposition to the bill incorporating the bridge company, and a statement from Mr. Clemens Herschell, civil engineer. (R & Z 6.)

Mr. Wheildon, counsel for the city of Charlestown, and others, stated that he had a large number of papers from various sources remonstrating against the proposed bridge, but, as they were merely confirmatory of the statements already offered, he would not burden the files of the commission with them. He, however, would offer statements from the Fitchburg Railroad Company, (J,) and from the Boston and Lowell and Nashua and Lowell Railroad Company, relative to the business of those roads done above the site of the proposed bridge. (L.)

The commission adjourned at 12 o'clock m., to meet at 10 o'clock a. m. to-morrow, Thursday, the 1st of October.

THURSDAY, *October* 1, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment; all the members being present. The record of yesterday's proceedings was read.

Hon. Josiah Quincy, chairman of the board of harbor commissioners, presented a statement from the engineer of the board relative to injurious effect of the proposed bridge upon the harbor and commerce of Boston. (V, with map.)

Judge Wright, counsel for the bridge company, stated that, in consequence of the absence of the engineer of the company, he could not be prepared to offer his final statement until Wednesday morning next, when he will complete his representation in behalf of the bridge company.

Judge Wright presented a letter of authority to appear before the commission for the committee on bridges of the aldermen of Boston.

The commission adjourned at 11.30 a. m., to meet at 10 o'clock a. m. to-morrow, Friday, the 2d instant.

FRIDAY, *October* 2, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment; all the members being present. The record of yesterday's proceedings was read.

Mr. Nathan Matthews, president of the Winnisimmett Ferry Company, presented the protest of that company against the bridge, and explained the reasons why obstruction would probably occur from ice as a result of its construction. (W.)

Papers were presented by Mr. J. E. Bartlett, enumerating the difficulties and delays at the present time at the draws on Charlestown bridges. (O.)

Counsel presented protests against the bridge, signed by all the owners and occupants of wharves between East Boston ferry and Charlestown bridge, (U,) and also from the Constitution Wharf Company. (X.)

Mr. Wheildon read a letter from Mr. Francis, civil engineer, relative to his address before the legislature, in opposition to the bridge. (R.)

The commission adjourned at 11 o'clock a. m., other parties desiring to be heard being not prepared, until 10 o'clock a. m. to-morrow, Saturday morning.

SATURDAY, *October* 3, 1868.

The commission assembled at 10 o'clock a. m., in accordance with adjournment; all the members being present. The record of yesterday's proceedings was read.

Mr. Wheildon read a letter from Hon. Thomas Russell, collector of the port of Boston, relative to the statistics of the commerce of Boston, as given by him in a paper before presented to the commission. (N.)

A communication was received from Commodore John Rodgers, commandant of the navy yard, giving his views in opposition to the proposed bridge. (Z 1.)

Requisition was made on the commandant for a map of Boston and vicinity.

The commission adjourned at 11.30 a. m., to meet at 10 o'clock a. m. on Monday, the 5th instant.

MONDAY, *October* 5, 1868.

The commission assembled according to adjournment, at 10 o'clock a. m.; all the members being present. The record of the last day's proceeding was read.

Mr. J. B. Thayer, counsel for remonstrants, presented a letter from Messrs. W. F. Weld & Company, merchants of Boston, representing the injury to commerce which would be caused by the proposed bridge.

Mr. Wheildon presented a paper from Professor Benjamin Peirce, Superintendent of the United States Coast Survey, expressing his objections to the erection of a bridge. (Z 4.)

Mr. Bartlett also presented a paper in opposition to the bridge. (O.)

The commission adjourned at 11 o'clock a. m., to meet at 10 o'clock to-morrow, Tuesday.

TUESDAY, *October* 6, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment; all the members being present. The record of the preceding day's hearing was read.

Mr. H. A. Hill, secretary of the Boston Board of Trade, presented the report of the committee of that board, protesting against the proposed bridge. (Z 3.) Mr. Hill stated that at the meeting of the Board of Trade no member appeared to advocate the cause of the bridge, although the whole number of members, 700, had been notified of the subject to be considered.

Mr. Bartlett presented a paper giving data relative to the dimensions, heights, &c., of vessels plying in Boston harbor. (Z 10.)

Mr. Thayer filed a paper from Mr. Clement Herschell, civil engineer, descriptive of a draw-bridge at Brest, France. (Z 6.)

Mr. Wheildon presented a statement of the commerce of Brighton, at the head of navigation on Charles river. (Z 5.)

Letters were received from Colonel Talcott, chief engineer of the Chicago and Northwestern railroad, in reference to the railroad draw-

bridge over the Mississippi river at Clinton, Iowa; also a letter from Robert Harris, general superintendent of the Chicago, Burlington, and Quincy railroad, concerning the railroad draw-bridge at Quincy and Burlington. (Z 8 and Z 9.)

The commission adjourned at 11 o'clock to make a tour of inspection of the harbor by invitation of the city government of Boston. The next meeting to be at 10 o'clock a. m. to-morrow, Wednesday.

WEDNESDAY, *October* 7, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment; all the members being present. The record of yesterday's proceedings was read.

Mr. Hill, secretary of the Board of Trade of Boston, filed a paper correcting a misstatement of the paper presented by him at the previous hearing. (Z 3.)

Mr. George Sherman, of East Boston, presented a paper advocating the proposed bridge. (F.)

Judge Wright then appeared in behalf of the bridge company and presented his argument advocating the interests of the company. (Z 7.)

The commission then closed its public hearings upon the matter and adjourned at 12 o'clock m., to meet at 10 o'clock a. m. on Friday, the 9th instant.

FRIDAY, *October* 9, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment; all the members being present. The record of the previous day's proceedings was read and the commission adjourned, awaiting the completion of their report, until Monday, the 12th instant, at 10 o'clock a. m.

MONDAY, *October* 12, 1868.

The commission assembled at 10 o'clock a. m., according to adjournment, all the members being present.

The report of the commission upon the subject under consideration was read and signed by all the members; upon which, its business being completed, under the orders convening it, the commission adjourned sine die.

The above is a true record of the proceedings of the commission, appointed by the honorable Secretaries of the Navy and of War, to investigate the subject of a bridge across Boston harbor, between Boston proper and East Boston, which met at this navy yard, on the 16th of September, and adjourned as stated, on the 12th of October, 1868.

S. H. STRINGHAM,
Rear-Admiral and President of the Commission.

(The papers referred to in the foregoing record are with the report of the commission to the honorable Secretary of the Navy.)

UNITED STATES NAVY YARD,
Boston, October 12, 1868.

SIR: The commission appointed by the honorable Secretaries of the Navy and of War, under the joint resolution of Congress approved July 7, 1868, "in relation to the erection of a bridge in Boston harbor," beg leave most respectfully to submit the following report.

The resolution referred to reads as follows:

No. 40. *Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Navy shall detail two competent and impartial officers of the navy, and the Secretary of War shall detail a competent and impartial officer of the engineer corps, who shall comprise a commission, whose duty it shall be to make a careful examination of the harbor of Boston, and shall report to Congress at its next session in what manner the commerce of said harbor, and the interests of the United States in the navy yard at Charlestown, will be affected by the construction of a bridge over the water between the main land in the city of Boston and East Boston, in the manner provided in an act of the legislature of the State of Massachusetts, entitled "An act to incorporate the Maverick Bridge Company;" and no bridge shall be erected by said company across said water until the assent of Congress shall be given thereto.

Approved July 7, 1868.

The commission met at this yard, as required by the honorable Secretaries' orders, on the 16th of September last, and immediately proceeded to the investigation of the matter before it; the letters of instructions of September 4th and September 12th, with enclosures from the honorable Secretary of the Navy to the president of the commission, first being read.

The enclosures with the letter of the 12th September consisted of copies of the act of the legislature of Massachusetts incorporating the Maverick Bridge Company, with the veto message of Governor Bullock thereon; copies of letters on file at the Navy Department on the subject of bridging Boston harbor; and a letter from the mayor and citizens of Charlestown remonstrating against the bridge proposed. This correspondence will be found with the minutes of the proceedings of the commission, transmitted herewith, and marked G.

Agreeably to the instructions of the department, the commission has afforded to all parties interested in the proposed bridge an opportunity to be heard.

The Maverick Bridge Company was first requested to present its plans and arguments in favor of the project, and also to anticipate any objections to the structure on account of its injury to the commerce of the harbor and the interests of the United States in the navy yard at Charlestown.

The papers presented on behalf of the bridge company were:

1. A letter from Hon. N. B. Shurtleff, mayor of the city of Boston, presenting Judge Edwin Wright as his attorney to represent his *personal* views in relation to the merits of the bridge. (A.)

2. A map of Boston harbor showing in red lines the probable limits, up and down the harbor, within which the proposed bridge will probably be built. (B.)

3. "The single-draw plan of T. Willis Pratt," in substantial conformity to which, "or such improvements as may be made thereon," the company is required by its charter to build the bridge. (C.)

4. The description of the said plan by Mr. T. Willis Pratt. (D.)

5. The statement of Messrs. Wright and Emery, counsel for the bridge company, explaining their position in not presenting any definite plan or location of the bridge, and showing the advantages of the project and the absence of any just cause for fear of injury to the commerce of the harbor. (E.)

6. A communication from Mr. George Sherman, a citizen of East Boston, favoring the bridge. (F.)

The objections of the opponents of the bridge were next invited, and the following list gives the parties from whom remonstrances or facts bearing against the erection of the structure were received:

1. The mayor and citizens of Charlestown. (G.)

2. The mayor and citizens of Cambridge. (H.)

3. Brevet Major General J. G. Foster, lieutenant colonel corps of engineers, United States army, in charge of the preservation and improvement of Boston harbor. (I.)

4. The Fitchburg Railroad Company, through Mr. W. W. Wheildon. (J.)

5. The Boston and Maine Railroad Company, through Mr. Wheildon. (K.)

6. The Boston and Lowell and Nashua and Lowell railroads, through Mr. Wheildon. (L.)

7. Owners and occupants of wharves in Charlestown. (M.)

8. Hon. Thomas Russell, collector of the port of Boston. (N.)

9. Mr. J. E. Bartlett, president of the Mystic River Corporation. (O.)

10. Merchants and wharf-owners in Boston and Charlestown, by Mr. J. B. Thayer. (P.)

11. Merchants and ship-owners of Boston. (Q.)

12. The Tudor Company. (R.)

13. The Boston Gas-light Company. (S.)

14. Mr. George M. Barnard. (T.)

15. All the owners and occupants of wharves between East Boston ferry and Charlestown bridge. (U.)

16. Hon. Josiah Quincy, chairman, in behalf of the board of harbor commissioners, (V,) with map.

17. Mr. Nathan Matthews, president of the Winnisimmett Ferry Company, (between Boston and Chelsea.) (W.)

18. Treasurer of Constitution Wharf Company, of Boston. (X.)

19. Messrs. J. F. & F. L. Gilman, Charlestown. (Y.)

20. Commodore George S. Blake, United States navy. (Z.)

21. Commodore Jno. Rodgers, United States navy, commandant of the United States navy yard and station at Boston. (Z 1.)

23. Messrs. W. F. Weld & Co., merchants. (Z 2.)

24. Board of Trade of the City of Boston. (Z 3.)

25. Professor Benjamin Peirce, Superintendent of the United States Coast Survey. (Z 4.)

26. J. G. & N. G. Gooch, representing the interests of Brighton. (Z 5.)

27. Clemens Herschell, civil engineer. (Z 6.)

All papers presented to the commission were read in open session, and all the parties interested, advocates and opponents of the bridge, allowed to make such notes or copies of them as they desired.

After all of the above enumerated papers had been presented to the commission, a statement was submitted by the counsel for the bridge company (Z 7) in rebuttal of the statements and facts submitted by its opponents. Here the testimony closed.

The commission has also inspected the harbor, with a view to obtaining a knowledge of the question before it, both independently and in company with a deputation of the city council of Boston, the chairman of the harbor commissioners, the commandant of the navy yard, and the two officers of engineers of the United States army having charge of the improvements, &c., of the harbor.

Having, therefore, all the facts before them, they proceed at once to discuss the question of the effect of the proposed bridge between Boston and East Boston "upon the commerce of the harbor and the interests of the United States in the navy yard at Charlestown."

Section 2 of the charter of the Maverick Bridge Company authorizes the erection of "a bridge over the water between the mainland in the city of Boston and East Boston." This is all that is said in regard to the locating of the bridge; there is not mentioned a starting or a terminating point. The only information which could be obtained upon this question

was that it might be located somewhere between the limiting lines marked in red ink on the accompanying map. (B.)

The next inquiry by the commission was as to the plan of the proposed bridge. In the accompanying statement (E) the counsel for the bridge company says "that they have not adopted any plans of bridge nor determined upon any location for the same, under their charter, further than is provided by the charter itself which the commission have. We now turn to the fourth section of the charter, and we read thus:

The said corporation shall construct the piers of said bridge of such materials, size, shape, direction, and position respecting currents and channels, and the said bridge with a draw at right angles with the channel, as near as may be, and with such accommodation for the passage of vessels through the same as the mayor and aldermen of the said city of Boston, on consultation with the harbor commissioners, shall direct or approve, but substantially in conformity to the single-draw plan of T. Willis Pratt, or such improvements as may be made thereon; and in all other respects shall construct the same to the approval of said mayor and aldermen; and shall provide and maintain a suitable steam tug-boat, or such other aids to the passage of vessels through the draw of said bridge, and for other purposes, as the said mayor and aldermen shall direct.

The company, then, are obliged to build a bridge substantially "in conformity with the single-draw plan of T. Willis Pratt, or such improvements as may be made thereon."

Now, Mr. Pratt describes his plan (see D) as follows:

This plan was only proposed in outline and contemplated a full width of 75 feet, to be divided into two roadways with a railing between, and two foot-walks, one on each side, outside of the roadways.

The draw-bridge to be nearly in the centre, so as to take advantage of the deepest water, and to be, as required by the act, at right-angles to the current. The suspension principle was adopted for the purpose of obtaining the widest spans, requiring the least number of piers, of which only three are to be constructed, or what would be needed for the draw-bridge alone.

The centre pier to be a cylindroidical one of 70 feet thickness, which must sustain the whole weight of the draw and the machinery contrived for its movements.

The two other piers to sustain the ends of the draw-bridge may be much narrower, probably only 20 feet, and at right-angles to the currents; but in the direction of the current must be the width of the bridge and extended up and down stream a greater or less distance, as may be judged advisable, and with pointed ends, or in the form of sharpened cylindroids.

The piers to be built of hammer-dressed granite, and laid in the most solid and substantial manner upon a pile foundation, if necessary—the piles truncated at or below the bottom of the channel, and the entire superstructure to be clamped and doweled in all directions with heavy metal.

The granite portion of the end piers of the draw to be carried up only to the under side of the roadway, and thence upwards to a sufficient height to be above the tallest masts of sailing ships, say 130 feet, at least, above high-water mark.

The under surface of the draw-bridge to be high enough above high-water mark to allow all tugs, steamers, yachts, &c., to pass freely at all times at least 30 feet above high water.

The draw is to be propelled by steam, and can be turned at notice, without ever detaining a vessel the least instant. This is already an accomplished problem of engineering, and entirely successful.

The total distance across varies from 1,500 feet to 1,800, as may be determined when the bridge is located.

The width of the draw, in the sketch presented, is made 162½ feet of clear water-way each side of the centre pier.

By section four of the act of incorporation, all the details are to be approved by the mayor and aldermen of the city of Boston, on consultation with the harbor commissioners.

On this plan the suspension cables will be shorter than upon any others, as the suspending towers are near the middle of the stream, and anchorages of the cables will be made in what would, in common plans, be the abutments of the bridge, thus not obstructing the approaches to the bridge by extending the cables backwards over the land.

Now the question before the commission is, will such a bridge obstruct navigation to such a degree as to injure the commerce of the harbor or the interest of the United States in the navy yard at Charlestown? and this involves other questions. How is the bridge located with regard to the harbor? what is the relation of the harbor to the world of commerce, foreign and domestic? and what is its relation to the navy yard?

If you look at the maps of Boston and its vicinity herewith transmitted, (B and B B,) you will find that the proposed bridge will extend right across the most valuable and central part of the harbor, and directly from the very heart of the most business portion of the city, leaving much the larger part of the harbor above its location to be affected by the obstruction of the bridge to vessels both coming to and departing from the wharves; that the bridge would, therefore, affect detrimentally the commerce of Charles river as far as it is navigable; the commerce of Charlestown; the interests of the United States in the navy yard; the commerce of the outlets of Mystic river and Chelsea creek, and of these streams, respectively; and the commerce of all the wharves of Boston proper, and of East Boston above the bridge.

In the words of Mr. J. E. Bartlett, president of the Mystic River corporation, (see paper O,) subscribed under oath, the "said Maverick Bridge, if built as allowed by said act of incorporation, would cut off not less than three-fourths of all the wharves on *deep* water in Boston harbor, together with the United States navy yard, which are now open to free and unobstructed communication with the sea."

But it may be said that the bridge will not be an obstruction for the reason that the draw being 162½ feet wide, steamers and sailing vessels can steam or sail through, or the latter be towed through by a tug without delay. With small steamers there would possibly not be any very great difficulty in passing the draw; but certainly a vessel which could sail directly without hindrance to her dock must be detained more or less by an obstruction which would prevent this. If the wind is adverse, or the tide did not serve, there would be delay, whether she was propelled by the wind or towed by a tug. It is not uncommon, too, that vessels, on account of a favorable wind, come into the harbor in fleets of from 100 to 200 sail. This has occurred since this commission has been in session. Certainly, as the charter provides for but one tug, half of these vessels (the proportion for wharves above the bridge) could not pass through the draw at once. Besides, the requirement of the use of a tug at all, when without the bridge it would not be needed, must entail expense; for the single tug provided by the company could not be ubiquitous to tow every vessel when it was ready. In addition to all this, there is the necessity of coming to an anchor to await the tug, or its turn to pass through the draw; and, when it does pass, if the tug tows it all the way to the wharf, there would frequently be a corresponding detention to some other vessel waiting to pass through; or, if the vessel is not towed to the wharf, there is the delay of making sail again or of anchoring to await another tug; and if the wharf is near the bridge the difficulty and delay of reaching it is increased by the limited space and baffling winds caused by the bridge.

The same may be said of sailing vessels and steamers clearing for sea from wharves near, above, and below the bridge. The former would lose time in being obliged to go up the harbor sufficiently far to lay their course through the draw; and in the latter case the bridge would interfere with the free movements of the vessel to lay her course down the harbor.

The foregoing is all predicated upon the supposition that the draw will always be opened at the proper time for vessels; but if the interest of East Boston is such as to require a structure of more massive proportions and cost than any that has yet been built in this country—if the travel and business is so great that ferry-boats cannot afford the necessary facilities—how great will be the throng of pedestrians and vehicles across the bridge, and what certainty is there that the land traffic and travel will not hinder the opening of the draws. And this

is likely to occur just in proportion to the number of vessels waiting to use the draw; for, though there is a considerable difference in the time estimated by different authorities for opening and shutting the draw, it is very certain, from the practical difficulties which are observed even in the cases of draws of the smallest dimensions, that a draw of the *colossal size and weight* of the one proposed for this bridge must require much more time than it does to open those of incomparably less weight and dimensions.

Knowing personally Mr. E. B. Talcott, the chief engineer of the Chicago and Northwestern railroads, and Mr. Robert Harris, the superintendent of the Chicago, Burlington, and Quincy railroad, General Simpson, member of this commission, addressed a letter to each of these gentlemen asking information respecting the working of the railroad draw-bridges over the Mississippi river, at Clinton and Burlington, Iowa, and at Quincy, Illinois. These bridges were selected by him because they were first class railroad bridges constructed on the most modern and approved plans, and approximated, in the length and character of their draws, more nearly to that proposed by the Maverick Bridge Company than probably to any others in the country.

The bridge at Clinton, Iowa, was constructed under the direction of Mr. Talcott. Both Mr. Talcott and Mr. Harris are men of the highest respectability, integrity, and intelligence, whose word no one could gainsay; and both, if they had any leaning at all, would most undoubtedly show it in favor of their bridges, and would give the least time possible for the opening and shutting of their draws.

Mr. Talcott writes:

1. The draw-bridge over the Mississippi at Clinton, Iowa, is built of iron on the plan known as Bollman's patent. It is a pivot bridge; extreme length 300 feet.
2. It is a single track bridge.
3. The clear water-way at low water for passage of steamboats is 120 feet.
4. The draw is operated with steam power, but is provided with hand-gear to be used in case the engine should be out of order.
5. The usual time for opening or closing the draw is three minutes, but it can be done in two minutes. (Z 8.)

Mr. Harris writes:

1. The draws in the bridges at Burlington and Quincy are both pivot draws.
2. Double—that is, swinging on the centre and having passages for vessels on each side—160 feet in the clear. The total length of the draw is 360 feet.
3. At present the draw is turned by hand, but we are preparing to turn them by steam. That at Clinton is turned by steam.
4. The bridge is only for a single track and is about 18 feet wide. I will give you the measure width in a supplementary note. [Note gives the width of bridges at 14 feet.]

Using hand power it takes about four minutes to make the necessary preparations, and four minutes to open the Burlington draw.

Using steam it takes three minutes to open the Clinton draw. (Z 9.)

Mr. Harris does not state the time it takes to close the Burlington draw, but it is to be presumed that, as in the case of the Clinton draw, it takes the same time that it does to open it—that is, four minutes.

Now, the Maverick bridge is one-third longer than the Clinton draw, and one-ninth longer than the draws of the Burlington and Quincy bridges. Its width, 75 feet, is five times greater than either of the bridges named; its weight, therefore, would be more than six times that of the Clinton draw, and more than five times that of the Burlington or Quincy draws. Surely, then, when it takes three minutes to open or shut the Clinton draw, and four minutes for the other draws, we are within reason when we estimate four minutes for opening or closing the draw of the Maverick bridge.

Then the elements of detention to travel may be stated, as we think very justly, as follows:

	m.	sec.
Time allowed to pedestrians and teams to leave the draw before moving 400 feet, at four miles per hour	1	8
Turning the draw by steam-power	4	
Draw open for passage of the vessel, say for a distance of 600 feet of run at three miles per hour	2	16
Closing the draw	4	
Total time of detention of travel for the passage of one vessel	11	24

Now, the counsel for the bridge avers in his rebutting statement (Z 7) that it is "shown by record and certified evidence" that the number of vessels above the line of the proposed bridge for the year 1867 was 9,919. As this number, then, must have passed the line of the proposed bridge on entering the harbor, and will pass it again on clearing, the number of openings of the draw will be double the number of vessels stated, or 19,838. This divided by 365 days of the year, gives 54 openings per day, which, at 11 minutes and 24 seconds for each opening, as above shown, makes 10 hours, 15 minutes, and 36 seconds, as the average duration, in every 24 hours, of interruption to the travel over the bridge by the opening of the draw.

The above, however, as stated, is but the average time that the draw of the bridge would necessarily be open in every 24 hours, supposing each, vessel to pass alone and the draw to be opened and closed for it.

The harbor-master of this port, Mr. John T. Gardner, in his letter accompanying Commodore Rogers's letter to the commission, (Z 1,) certifies that—

> He has no doubt in his own mind but that he has seen as many as 200 vessels pass the proposed site of the Maverick bridge in one day; and when a fleet of vessels arrives, he does not think the passage of 100 vessels in a day an unusual occurrence.

Now, in the first case of the passage of 200 vessels, the draw would have to be open, under the above calculation, 38 consecutive hours; and in the latter more common occurrence, of the passage of 100 vessels, 19 hours.

These deductions, from carefully ascertained and incontrovertible data, are adduced to show the conflict which must arise between the land travel over the bridge and the commercial interests of the harbor, and therefore the detriment which may result to both in loss of time and money from changing a good system of ferriage to a single bridge with a draw; and these remarks will apply to any kind of a bridge except a suspension bridge, which should be high enough to admit the passage of vessels of every class under it at any point.

In the foregoing discussion the commissioner has not included a great number of ocean and harbor steamers, tugs and yachts which would have to pass the bridge.

The counsel for the bridge company in his statement (E) says this is effected in T. Willis Pratt's plan by "a clear passage under the bridge of 30 feet at high water, and about 42 feet at low water, by which all steamers, tugs, and small sailing yachts, and other crafts may have unobstructed way at all times." T. Willis Pratt, however, in his description of his plan, says "the under surface of the draw bridge (not of the whole bridge, as stated by the counsel) is to be high enough above high-water mark to allow all tugs, steamers, yachts, &c., to pass freely at all times, at least 30 feet above high water," and his plan accompanying his

statement corresponds thereto. (C and D.) Now, to show how utterly impracticable this is, Commodore Rodgers in his letter (Z 1) supplies the following data relative to the height of vessels:

	Above load line.	
	To top masthead.	To top-gallant masthead, with lightning-rod.
	Feet.	*Feet.*
Frigate Franklin	150.50	210
Frigate Minnesota	149.50	205.50
Frigate Wabash	149	205

From which figures it will be seen that so far from steamers of this class passing under the bridge, they would not be able to pass under the suspension cables above the draw, which the plan of Mr. Pratt, as described by him, contemplates, at a possible height of 130 feet above high water. Indeed, in order to the passage of such vessels at all times without hindrance the suspension cables would require a height at the draw of *at least* 212 *feet above high-water mark.*

But even in the case of steamers of the smaller class, except tugs, it appears in evidence, (Z 10,) not to say anything about their masts, that their smoke stacks range from 45 to 61 feet above the water line. How, then, is it possible for vessels, even of this smaller class, to pass anywhere under the bridge, as promised by the counsel, or even under the draw, as stated by Mr. Pratt.

The foregoing proves very conclusively to this commission the that proposed bridge would be a very serious hindrance to the free navigation of the harbor, and, to the degree it is such, damage the commerce of the port and the interests of the United States in the navy yard at Charlestown. Indeed, in the case of the latter the bridge would be an effectual barrier to war vessels, of any except the smallest class, from getting to or leaving the yard; and thus this first class naval depot of our country wouldbe degraded to one of inferior character, if not, indeed, made valueless.

Commodore Rodgers, in his letter upon this subject, (Z 1,)—and the commission fully concurs with him—holds the following language:

It occurs to me as a seaman that the principal harbors, even of a country less extensive than ours, are too useful to the world to be obstructed for merely local purposes.

Into whatever port a ship enters she finds the care takento facilitate navigation is in proportion to the civilization and intelligence of the nation possessing it. She finds in Boston charts published, pilots licensed, light-houses erected, buoys placed, obstructions carefully marked or removed, fortresses built to preserve peace and ensure neutrality.

No nation which has the skill to design the "Maverick bridge" would grant permission to build it.

The immovable property in this navy yard is estimated by the civil engineer of the yard at the value of $30,000,000. This property is held for the sole purpose of sending vessels to sea, and the millions annually expended here have no other ultimate end in view.

The government has now the right of free access to the ocean through a channel stretching from shore to shore.

The Maverick Bridge Company ask permission to confine this passage to a draw.

No experienced seaman can aver that in unfavorable circumstances of wind and tide the passage of a large and deep vessel through the draw would not be fraught with danger at once to the vessel and to the draw.

A very small per cent. of risk would, with so costly a structure as a single steam frigate, amount to a large sum, but the importance of promptly and safely getting a fleet to sea in some national exigency cannot be estimated in coin.

Who can reckon the value of the opportune arrival of a new army corps at Bull Run, for instance, or, in such a case, estimate the national loss involved in a few hours' detention?

A contingency is possible in which the Maverick bridge might turn the event of a battle.

But for this narrowing the channel, and for the risk of passing the draw, and for the hindrance of our fleet in a national crisis, the Maverick Bridge Company has no equivalent to give, and offers none.

No vessel would choose to beat very near it; no vessel can beat to her anchorage beyond it; no large vessel would choose to anchor within six or seven hundred feet of the bridge, for fear of dragging her anchor in bad weather and swinging against the structure.

The injury to an important part of a great commercial port can scarcely fail to injure the whole, as the paralysis of a limb injures the whole man.

This harbor is the principal one in New England, and the interest involved in its conservation extends wherever its commerce reaches. No local pleas should prevail in so wide a concernment.

But in effect the Maverick bridge, by damaging the property above it, will give an increased value to that below it. It will take away from the United States and from part of its citizens the valuable natural right of unobstructed navigation, whereby the property below the bridge will be benefited.

It may be doubted whether the bridge would do more than change the centre of commerce and money value in the port—it would surely do this; but it is very uncertain whether the draw would not be open too often and too long to leave the bridge useful as a means of transit.

But there are other objections to the bridge than those already mentioned. Its piers will undoubtedly tend to hold and accumulate the ice in winter above the bridge; and the scouring process due to the acceleration of the current, from the contraction of the cross section of the channel, will do its work more or less in lifting the material from the bottom in the vicinity of the bridge, and depositing it at points where it will be most detrimental to the harbor.

Mr. Nathan Matthews, president of the Winnisimmett Ferry (steamboat) Company, on this subject says, for 15 or 20 years last past he has been president or manager of said company, whose boats ply between the cities of Boston and Chelsea; that said boats have been the most potent agents in keeping the upper portion of the harbor *free* of *ice* in the winter season, during the severer portions of which they are obliged to be run all night; that in his opinion, should any obstruction be allowed to be placed in the narrow strait below, (between the main land in Boston and East Boston,) no existing available appliances would be able to prevent said upper portion of the harbor from being closed by ice, and for the time being lost to navigation. (W.)

Professor Benjamin Pierce, Superintendent of the United States Coast Survey, says that he has continued his consideration of the subject with unabated interest, and that his inquiries confirm him in the opinions which he has repeatedly given. He believes that no bridge can be built to East Boston which will not delay navigation much more than it will facilitate trade; that for every ton which will be expedited in transit over the bridge, there will be many tons obstructed in the passage through its draw, and that the gain to the real estate of East Boston will be more than equalled by the loss of value of the wharves. The piers of the bridge will be an obstruction to the ice, and will serve to keep it accumulating above the bridge to the manifest injury of a very large commerce. Each pier will also be a contraction of the channel for the flow of water, and will accelerate its flow, from which would result the same kind of injury as that to which the harbor of Boston has already been subjected by the bridges across the Mystic and Charles. The scouring influence of the water would be increased, and material taken from the bottom in the vicinity of the bridge would be carried into the harbor, where it would be deposited with the previous deposits at those points just where the harbor is most valuable. In one word, then, it would appear that while the proposed bridge may be a small local benefit, it must be a great public injury, and especially injurious to the navy yard at Charlestown. (Z 4.)

Brevet Major General J. G. Foster, lieutenant colonel of engineers, in charge of the preservation and improvement of Boston harbor, says, "It is a singular coincidence that while the United States is expending nearly half a million of dollars in the preservation and improvement of the harbor and in removing obstructions from the channels, the State should authorize the construction of a greater obstruction, and one especially detrimental to the rights and interests of the United States." (I.)

In all that has been stated the commission has said nothing of the tax upon the import and export trade of the district of Boston which will be imposed by the erection of the Maverick bridge.

The amount of this trade in the year 1867, as collected from the statistics of the Boston Board of Trade, was $64,606,626, and as half of it will pass above the bridge and therefore be affected by the extra charges of freight on account of the bridge, to the extent of this additional amount will the cost of all such imports and exports be enhanced to the consumer.

The commission could go into particulars in relation to the interests of the four important railroads which have their terminal wharves and depots on the Charles river above the proposed bridge, and are therefore so situated as to be very materially affected by it. These are the Fitchburg, the Boston and Maine, the Eastern, and the Boston and Lowell railroads. These roads, by their ramifications, extend to the remotest parts of northwestern New England and even to Canada, and it will be sufficient to mention this fact to give a suitable idea of the magnitude of their interests. For further particulars concerning this matter the commission would refer to papers marked J K L.

The commission would also direct attention to the papers from the mayor and citizens of Cambridge (H) in reference to the great interests which their city, reputed to be the second in the State in point of wealth, has in this question.

The commission also refer to the remonstrance of the city of Charlestown, (G;) to the protest of *all* the owners of wharf property in Boston *above* the bridge, (U;) to the paper from the board of harbor commissioners, (V;) and most especially to the report of the committee of the Boston Board of Trade, (23,) unanimously adopted by the board, not one of its 700 members opposing, which most earnestly protests against the proposed bridge, and to the great number of other papers of remonstrance. Indeed, with the exception of one resident of East Boston, the mayor of Boston and his counsel, who either reside in or have interest there, the commission has seen no one who in the slightest degree favors the proposed bridge.

There was a time doubtless when the subject was less thoroughly understood than it appears to be now; when there were some persons who gave their names to the scheme; but during the sessions of this commission none such, save those mentioned, have appeared to prosecute it to success.

In this connection the commission thinks it proper to present the following extracts from the report of the Boston Board of Trade, (Z 3:)

> This charter was given, not in consequence of any special requirements of the general business of the city, nor in response to any urgent demand for it on the part of the commercial community, but simply to supply what was supposed to be needed in the way of additional facilities of communication between East Boston and the city proper. It was initiated as a local measure; it has been advocated almost exclusively by the residents of a single locality; and whatever advantages may result from it, if consummated, will enure chiefly to that locality.

It may be proper to remark here that the population of the island of East Boston, as given by the counsel for the bridge company, numbers

25,000. That of Boston proper, including East Boston, South Boston, and Roxbury, was in 1867, as estimated in the report of the Boston Board of Trade for 1868, 230,000, or, excluding East Boston, 205,000. This is stated to show the relative importance of the two opposing interests.

East Boston has a steam ferry between it and Boston proper, and, in addition to this, a road connection through Chelsea; and in this respect is certainly better situated than Brooklyn, which has a population of 300,000, with regard to New York city.

The commission presents one more extract from the able report of the Board of Trade:

> The board did not act when the petition of the East Boston people was before the legislature last spring, because it was generally supposed to be impossible that the charter asked for would be granted; and because, also, it was thought that the opposition presented by individuals and corporations more immediately concerned would be sufficient and successful. The refusal of the legislative committee to report a bill, and the veto subsequently by the governor of the bill introduced on leave, indicate the force of the considerations which had been urged against the measure; but, unfortunately, they did not prevent its passage at almost the last moment of the session. The report of the joint committee on the harbor, of the city government of Boston, against sending a petition to the legislature in aid of the bridge, and which was concurred in by both branches, is appended to this report. But we must not be taken at unawares again, and especially now that the field of action has been changed from Boston to the national capital. It is respectfully recommended, therefore, that this report be transmitted to the honorable commission now in session at the navy yard, as an expression of opinion decidedly hostile to the erection of any bridge across the channel between the mainland of the city of Boston and East Boston; and, further, that this board memorialize Congress at its next session to the same effect.

The counsel for the bridge company has furnished the commission with a great deal of testimony, a large part of which seems to have been collected previously to the passage of the act granting the charter to the company, and doubtless to effect it—(accompanying Z 7.) Extracts, also, from the reports of the United States commissioners on Boston harbor, of 1864 and 1866, are adduced in support of his argument; but, as they evidently have regard to the bridges over *Charles river* which the railroad exigencies of the country at large may justify, it is not seen how they in the least apply to the present project of a bridge across the middle of the harbor.

A description and photograph of the bridge at Brest, France, accompany their papers; but, as this bridge does not intercept commerce by passing over the middle of a harbor, and is located right at the mouth of a naval dock, they in this case have no bearing.

There is a great deal of testimony, not in an original shape but attested by the counsel for the bridge company, in relation to the opening and shutting of draw-bridges, which, evidently from its date, was obtained for the purpose of influencing the legislature for the passage of the act of incorporation of the company. But, independent of this fact, they all relate to draws of such small dimensions and weight compared with that proposed for the Maverick bridge, and the vessels passing these draws are of so much less tonnage than ocean steamers and vessels, that they cannot in reason be considered as parallel cases.

The counsel for the bridge company, in their explanatory and rebutting statement, have been pleased to say that

> The company have a large mass of evidence and statistics controverting statements introduced by the opposition, but as these in many instances have been ruled upon by the commission as irrelevant and unnecessary, &c., we refrain from introducing the same.

To all of this the commission replies, that the statement is simply an *untruth:* the commission has not in a single instance refused to receive any paper which the counsel had to present; on the contrary, they adjourned their sessions from day to day, for 10 days, much to the incon-

venience of the other parties, in order that this very counsel might, as they requested, have all the time necessary to prepare just such papers as they might think proper to present.

The commission having now as it believes presented all the facts and statements of both parties, and given its own reasoning in the premises, respectfully concludes with the emphatic opinion:

1st. That the commerce of the harbor of Boston will be very seriously and injuriously affected by the erection of the proposed Maverick bridge, or by any bridge from Boston proper to East Boston—except a suspension bridge which would allow the passage of vessels of the first class under it at any point.

2d. That the interests of the United States in the navy yard at Charlestown will be very seriously damaged by such bridge.

3d. That a bridge between the points mentioned should not be authorized.

All of which is respectfully submitted by your obedient servants,

S. H. STRINGHAM,
Rear-Admiral and President of the Commission.
CHAS. H. BELL,
Rear-Admiral and Member of Commission.
J. H. SIMPSON,
Bvt. Brig. Gen'l and Col. of Engineers U. S. A., Member of Commission.

A

EXECUTIVE DEPARTMENT, CITY HALL,
Boston, September 16, 1868.

GENTLEMEN: In my inaugural address, delivered before the two branches of the city council, in January last, I called attention to the necessity of a better communication between East Boston (so called) and the peninsular part of the city. This I deemed necessary in consequence of the proposed improvements which I thought would be inaugurated during my administration of the affairs of the city, and from a positive knowledge of the great inconveniences to travel and to transportation of heavy and bulky articles from one to the other of the said parts of the city existing. The suggestions were received very favorably, and persons having a direct interest in the matter petitioned the legislature for an act of incorporation for a bridge to extend from the north part of the city proper to East Boston; and after a protracted legislation, hearings having been most patiently extended to all parties, an act was granted almost unanimously in the senate, and by a very large vote in the house of representatives, even after the interposition of a veto by the governor.

My opinion, since entering upon office and coming into more immediate contact with the business citizens of Boston, has been strengthened respecting the necessity of this communication between the parts of the city being more convenient and substantial than at present; and I consider the fears expressed by some of our estimable citizens as entirely without foundation, and am satisfied that they will so appear as the building of a bridge shall progress. The recent achievements of engineering skill, the new modes of transportation and of moving vessels in harbors, and the general application of steam power, make entirely feasible now, improvements that a few years since would have been deemed

quite impracticable. I am also convinced that the structure contemplated by the charter of the Maverick Bridge Company, carefully limited as its provisions are, is one that cannot injuriously affect the waters, the tides, or the forces of the harbor. It is my opinion that by it the commercial, mechanical and manufacturing interests of this city and vicinity will be very largely increased. The railroad facilities it will afford, as connected with our domestic and foreign commerce, cannot be now fully anticipated. Fearing that it may not be in my power to give sufficient personal attendance upon your hearings, and believing that you will give the matters intrusted to you that broad and liberal consideration which their great importance demands, I have requested Judge Edwin Wright to appear before your commission and represent my views so far as the public interest shall seem to require attention.

Respectfully,

NATH. B. SHURTLEFF, *Mayor.*

Rear-Admirals S. H. STRINGHAM and C. H. BELL, and Brevet Brigadier General J. H. SIMPSON, *United States Engineers, Commissioners, &c.*

D.

Statement of Mr. T. Willis Pratt, engineer of proposed bridge, accompanying plan.

PLAN OF MAVERICK BRIDGE, AS DESIGNATED IN THE ACT OF INCORPORATION, THE "SINGLE DRAW PLAN OF T. WILLIS PRATT."

This plan was only proposed in outline, and contemplated a full width of 75 feet, to be divided into two roadways, with a railing between, and two footwalks, one each side outside of the roadways, the drawbridge to be nearly in the center so as to take advantage of the deepest water, and to be as required by the act at right angles to the current. The suspension principle was adopted for the purpose of obtaining the widest spans requiring the least number of piers, of which only *three* are to be constructed, or what would be needed for the drawbridge alone; the centre pier to be a cylindroidical one of 70 feet thickness, which must sustain the whole weight of the draw and the machinery contrived for its movements. The two other piers to sustain the ends of the drawbridge may be much narrower, probably only 20 feet, and at right angles to the currents, but in the direction of the current; must be the width of the bridge, and extended up and down the stream a greater or less distance, as may be judged advisable, and with pointed ends or in the form of sharpened cylindroids. The piers to be built of hammer dressed granite, and laid in the most solid and substantial manner, upon a pile foundation, if necessary, the piles truncated at or below the bottom of the channel, and the entire superstructure to be clamped and dowelled in all directions with heavy metal. The granite portion of the end piers of the draw to be carried up only to the under side of the roadway, and thence upwards to a sufficient height to be above the tallest masts of sailing ships, say 130 feet, at least, above high-water mark. The under surface of the drawbridge to be high enough above high-water mark to allow all tugs, steamers, yachts, &c., to pass freely at all times—at least 30 feet above high water.

The draw is to be propelled by steam, and can be turned at notice, without ever detaining a vessel the least instant. This is already an

accomplished problem of engineering, and entirely successful. The total distance across varies from 1,500 feet to 1,800, as may be determined when the bridge is located.

The width of the draw in the sketch presented is made 162½ feet of clear water way each side of the centre pier. By section 4 of the act of incorporation all the details are to be approved by the mayor and aldermen of the city of Boston, on consultation with the harbor commissioners.

On this plan the suspension cables will be shorter than upon any others, as the suspending towers are near the middle of the stream, and anchorages of the cable will be made in what would in common plans be the abutments of the bridge, thus not obstructing the approaches to the bridge by extending the cables backward over the land. The design was to present the least obstructions either to the flow of the waters, the occupancy of the wharves, or to navigation.

1. By the plan of the bridge proposed, steamers, steam tugs, and all small sailing craft will not be *at all* at any time impeded in their passage up and down, or over any and all parts of the harbor, and to this extent interruption or obstacle by the bridge to commerce is impossible.

2. All vessels entering the harbor in charge of tugs can pass through the draw with as much convenience as over any other part of the harbor, and without the least detention.

3. For other vessels impelled only by sails the draws are the widest yet constructed, so far as I know, and afford ample space for the largest frigate to pass through—even considerably less width would doubtless be regarded ample—but the presence of a steam tug to take all vessels through and to their wharves by steam would seem to do away with any possible hindrance or obstacle to their passing by night or day.

4. The piers in the harbor will not seriously, if at all, affect the water or the forces of the harbor, for with proper position respecting currents, all of which is carefully provided for by this bill, it is a well-settled principle of hydraulic engineering, such piers placed at right lines and at large intervals across a channel produce but slight disturbing causes, and which exhaust their effects in very short periods of time, and the consequent disarrangements of which, if there be any, are of entirely easy and cheap remedy.

5. The great length of the spans render the objection of deleterious effect in respect of ice on a part of the harbor traversed hourly by tugs and other vessels to the amount of such transit in Boston harbor, simply captious and puerile.

6. That bridges have been and are continually permitted where the demands of land transportation and travel have shown an exigency over the demands for a free water navigation, and the obstacles in the present case are intended to be reduced to the minimum in all respects.

7. Almost all movements in Boston harbor of large vessels are accomplished by steam, and this method of movement is yearly increasing, and the bridge contemplated will but slightly interrupt the movements required in the narrows.

8. Excepting the navy yard, the water front that will be above the probable location of the bridge is comparatively small—that express opposition to the bridge—and by much less in extent and inferior in quality to those that will become available by the bridge.

9. It must be acknowledged by all professional seamen that those wharves are the best situated which give the most protection to shipping during the severest windy weather and the most prevalent storms.

10. The entire shore of East Boston, from the "People's Ferry slips" eastward, contains wharves by which vessels are secure in all north, northeasterly, or easterly storms, the prevailing ones of Boston harbor.

11. A bridge connection might induce or invite the extension of this water front by a solid causeway entirely to Governor's island, a distance of a mile and a half further, thus placing the channel of Boston harbor under the lee of a breakwater for that distance, in addition to which would be the southwest shore of Governor's island of about half a mile, which is controlled by the United States, a plan of which has already had the endorsement of our eminent authorities.

12. If the bridge were located at either of the ferry slips, the ordinary anchorage ground would not only not be obstructed, as large vessels are not now allowed to anchor in the narrows, but would be actually enlarged in area and availibility.

13. The Boston and Albany Railroad Company are now completing their connection by rail with the Grand Junction wharves at East Boston, and by so doing will also secure a connection with every railroad around Boston, and a tide-water depot, the best that can be desired, and at the least expense. Thus a new and large wharf frontage will be opened. The practical success of this movement depends very largely upon the facilities which can be afforded by this bridge, and without which this wharf front must in all reason continue unoccupied and useless to the city and commonwealth as it has for years been.

The writer of this, a native and resident of Boston, now of the age of 56 years, was a student in engineering in the office of Loammi Baldwin, esq., and was first employed on the dry dock in Charlestown navy yard, and subsequently on the dry dock in the Norfolk navy yard. He has also been employed on various railroads in New England, Boston and Lowell, Boston and Worcester, Providence and Worcester, Middletown, Hartford, and New Haven, New York and Boston, and lastly the Eastern railroad, and within the last two years has completed a bridge for the Eastern railroad of 1,200 feet in length across the harbor of Newburyport, near the mouth of the Merrimack river. This bridge has an iron draw of 182 feet, total length, accomplishing the opening of two water-spaces of 65 feet each.

All of which is respectfully submitted.

T. WILLIS PRATT, *Engineer.*

E.

Statement of counsel for the bridge company.

The Maverick Bridge Company, by direction of the United States commission, in session at Charlestown navy yard, September 25, 1868, file the following statement:

First. That they have not adopted any plans of bridge, nor determined upon any location for the same, under their charter, further than is provided by the charter itself, which the commission have.

Second. That the plan upon which said bridge shall be built, material, position, &c., for wise and prudential reasons, were, by the legislature of Massachusetts, deposited in the hands of the mayor and aldermen of Boston, and the harbor commissioners of Massachusetts, as by said charter. That this company have never yet obtained the determination of said bodies, or either of them, in any of said particulars, and have not proposed to do so until the preliminary questions of their authority should have been settled, and until such time they have considered such an effort premature, and as involving an unnecessary expend-

iture of time and labor, and a very large outlay of money, all of which might become useless. If in this they have erred, it is impossible now to procure such plans, and designate such location for the purposes of this hearing.

Third. This power to determine plans, and fix locations, &c., subject to the limitations of the charter, was lodged in the two bodies aforesaid, in order chiefly that no damage should by it accrue to the waters of the harbor, and no obstructions to commerce, beyond what was inherently necessary in the best style of bridge the present advanced state of engineering could devise.

The harbor commissioners are engaged in works involving surveys and engineering alterations of the harbor.

The city of Boston has for years prosecuted surveys and examinations of all the waters and forces of the harbor and its tributaries for many miles inland, all of which have been conducted by or under the charge of engineers of the United States, and with the results and principles of which they are the custodians. Qualified thus by actual scientific intelligence, and also by their supreme interest for the highest preservation of the harbor, an interest larger and more immediate and more vital than that of any or all other citizens or municipalities, they were adjudged the parties most suitable, and best responsible, to take care that the bridge, demanded by public necessity, should be not only built, but so built that the harbor and its commerce should receive no detriment.

Fourth. The charter requires and permits a bridge which *shall not* objectionally interfere with the qualities or interests of the harbor or commerce of Boston, *and no other*, and has secured this result by the guardian care above named, to whose arbitrament it has submitted directly, or by controlling inference in all its details, but by actually incorporating in the act limitations that make sure that result, viz., that it shall be in substantial conformity to the single-draw plan of T. Willis Pratt, and that a tug shall be constantly maintained by the company.

That conformity fixes the following particulars, to wit:

First. A bridge with only three piers for a draw.

Second. A clear passage under the bridge of 30 feet at high water, and about 42 feet at low water, by which all steamers, tugs, and small yachts, and other craft, may have unobstructed way at all times.

Third. The towers at the ends of the draw to be of sufficient height to allow vessels to pass under their cables clear.

Fourth. A draw, 400 feet in total length, and with two clear passages for vessels of 162½ feet, opening simultaneously; this draw to be operated by steam, and always open for vessels without detention, either by anchoring, or warping, or any other ways.

As nearly all the large vessels, and a large proportion of small ones, enter the harbor at the present day by steam-tugs, all such vessels can pass the line of the bridge, and not by possibility experience any detention, and to this additional extent commerce could not be obstructed.

We are informed that all the vessels of the navy come to the harbor, and to their moorings at the navy yard, by steam, and so they would not be detained.

For vessels passing the bridge by sail the act requires the corporation to maintain a steam-tug to aid in passing them through the draw and to their wharves, and to prevent all detention. This has been practically done, without the slightest delay having at any time occurred, at several bridges in this country, and is now in successful hourly practice.

And with this facility every vessel entering Boston harbor, and passing

the line of the proposed bridge will have unobstructed passage in one or other of three ways to any point above, viz:

1st. Under the bridge, as, e. g., steam-tugs, &c., &c.

2d. Through the draw by their own steam power.

3d. Through the draw by means of the steam-tug of the company.

Fifth. For further construction details of the bridge we respectfully refer to the statement of the engineer, T. Willis Pratt, esq., accompanying this.

Sixth. In respect to ice. The space above the bridge is traversed daily, every 15 minutes, by two ferry-boats plying between Chelsea and Boston, and the space is constantly traversed by a great number of vessels, amounting, if the statements of the opponents to the bridge be credible, to some 30,000 a year, or 100 a day.

This frequent passing up, down, and across this part of the harbor by vessels of all sizes and styles will, in all but extraordinary occasions, prevent the formation of ice fields; certainly to any such extent that their outward flow would be impeded through bays of a bridge from 600 to 800 feet wide, as the bays of this bridge are.

But in addition to all this the city of Boston has, for many years, kept in constant employ in the winter season, whenever necessary, one or more steamboats to assist in keeping the harbor free of ice for its entire length.

And if any doubt or possible trouble could exist or be apprehended, even beyond this, there will be also added, over and above all, the powerful steam-tug boat kept by the company under the requirements of their charter, always prepared on demand to operate as an ice boat.

And we therefore claim that there neither is, nor can be, any increased danger or difficulty that can be apprehended in this regard over and above what now exists; that increased instrumentalities to secure its being broken up, and facilitate its outflow, will exist, and be in constant employment, and thus the bridge with its appliances become a positive gain to the harbor and commerce of Boston.

Seventh. The area of the harbor, clear and available for commerce, will be materially enlarged. This proposition is self-evident upon the face of things, for it is matter of common knowledge that in *all that part* of the harbor traversed by the ferries, (People's and East Boston,) including the area between them, the rules and the practice of the harbor have uniformly been to allow but one vessel to be anchored. The paths of the ferries are also required to be kept at all times clear for the width of the swing of the ferry-boats, amounting, in the aggregate of both ferries, to from 1,400 to 1,600 feet up and down the harbor.

Now, by the location of the bridge, a permanent and not swinging structure, the whole area occupied by the boats of certainly one line of ferry and the intermediate space between these lines will be relinquished to the purposes and uses of commerce, free and clear of every obstruction. The statement that this area will be diminished or shortened in any degree is simply both absurd and false.

Eighth. As it has hitherto been *conceded on all hands* that the piers of the proposed bridge would not materially injure the waters, currents, or forces of the harbor, and that such injury, if any there should be, would be small in amount, short in duration, easily and quickly remedied, we do not feel called upon to make, in this respect, at present, any further statement.

WRIGHT & EMERY,
Attorneys for Bridge Company.

F.

Mr. George Sherman, citizen of East Boston, favoring bridge.

The advantageous situation of East Boston marks it for a city equally large and important as the whole of the present city proper of Boston. Its miles of deep water in the shelter of the finest of harbors, easy of access, are impatiently waiting for ten times their present commerce. When favorable sites for cities are so eagerly sought for by capitalists in all parts of the world, why East Boston, possessing a city's natural advantages in an equal degree with Boston, remained 200 years unimproved, we will not now stop to explain. Such is the fact, strange as it seems; but now that men are going to and fro with railroad speed, and knowledge is increased, East Boston cannot be much longer neglected. It possesses acres of the most valuable wharf property, unused, unknown, and neglected. Places for residences and for business equal to any and all those of the city proper are comprised within its limits. The chief reason for such utter neglect is its want of free communication with the large city of which it forms a part, and which certainly ought to be an advantage, not a hindrance and an injury to it. The ferries in their imperfect way furnish a means of access, but they are most forbidding and unpleasant in situation, in accommodation, and in the first requirements of good, sufficient, and easy access. South Boston has three or four bridges, Cambridge two or three, Charlestown its four or five, all of them free, while East Boston has no bridge, only ill-constructed, unsightly ferries, which tax in money all who are obliged to use them. East Boston and Breed's island, both parts of the city of Boston, are nearly equal in extent to the whole of Boston proper. The miles of deep water make it equal to all the rest of Boston for commerce. The extent of vacant land is sufficient for more than double its present population. It is well fitted for the profitable investment of more than 20 times its present valuation of real and personal property. The great obstacle to this improvement is want of means of common, ready access. The extreme caution of capitalists prevents their going to the expense of removing such an obstacle. It should be done by the city or State, as it is for the common benefit of all. The ferries do not furnish the required means of communication, and a single bridge is not sufficient. While access to Boston in any other direction is free, such access by East Boston is burdened with a tax; $500 per day, $150,000 to $180,000 per year, is now paid by one ward of the city for the shabbiest kind of access to the very city of which it is a part. And were these ferries free, and the accommodation such as the city of Boston requires, still a free bridge would be the only real union of the two parts of the city. Ferries keep them separate. In times of fog, during heavy southeast gales, and in the icy times of winter, it is dangerous running the ferries, and communication is sometimes stopped entirely. We want bridge communication and must have it at some time, the sooner the better. If the proposed plan of a bridge will very seriously interrupt navigation let us have another. But this charter having been granted by the legislature of Massachusetts after the fullest discussion of the objections now here brought, it remains for those opposing to show the real obstruction, if any, which this proposed bridge makes. If but little compared to the great advantages accruing from its use, then they who oppose ought to advocate its construction. The adding of a city equal in wealth, commerce, and population, to the present city of Boston, can be no injury to Charlestown, Chelsea, Cambridge, or to any town in our vicinity. Instead of damage or loss their commerce and business will be increased 10, 20, and 100 per

cent. The head and front of the opposition comes from the belief that free communication with East Boston will hurt the city and its adjacent towns. This is all a mistake, an unfounded fear. It seems clear that a *fac simile* of Boston in situation, and side by side with it, cannot much longer lie unvisited and unknown. Treated with common fairness it will at once take its proper place. Maps that would show the commanding situation of East Boston seem to have been carefully suppressed. Not a single map have I ever found where East Boston and its surroundings are fairly laid down in connection with the city of Boston, and on the same scale. East Boston is like Boston, Halifax, St. John, N. B., New York, or Brooklyn, and the same reasons for their growth, population, and commerce, apply with even greater force. One-tenth of the deep water, one-tenth the wharf room, one-tenth the extent of land placed as East Boston is, anywhere on the Atlantic shore, would make an important commercial city. Why allow longer this mistaken fear and foolish feeling to prevent access free, sure, and constant, to East Boston? Chicago has increased 100, nay 1,000 fold, in wealth and valuation during 20 years past. East Boston, with advantages in many respects superior, has hardly held its own, and real estate in some parts of it is lower than it was 20 years ago! Rents and real estate, the true criterions of value, are lower now and less increased than in almost any place of similar situation within a circuit of 10 miles. Take now from Boston the commercial advantages derived from East Boston, and Boston sinks immediately to a third or fourth-class city. Its growth ceases. Her high stand as a city she owes to the deep water of East Boston; without it, wharf room and accommodations for European steamers for the East India trade, and berths for from one-third to one-half the shipping of Boston, can nowhere be obtained. East Boston's interests are only incidentally mechanical, they are mostly and chiefly commercial, and need the development of good bridge communication.

GEORGE SHERMAN,
Thirteen years a resident of East Boston.

EAST BOSTON, *October* 7, 1868.

G.

Copy of remonstrance of mayor and citizens of Charlestown against the Maverick bridge, addressed to the honorable Secretary of the Navy.

CHARLESTOWN, *August* 19, 1868.

The undersigned, citizens of Charlestown, aware of your official visit to the navy yard of the United States in this city, respectfully ask your attention to the subject of the proposed Maverick bridge, and the contingent suggestion of the removal or discontinuance of the navy yard.

The act of the legislature authorizing the Maverick bridge was passed at the close of the session by a barely constitutional majority, against the earnest protest of the governor of the State, and is unquestionably a measure adverse to the interests of the city of Boston as a commercial port, and still more directly injurious to the property and prosperity of the city of Charlestown.

Under these circumstances, in view of the present and prospective importance of the port of Boston, as one of the chief commercial depots of the country, we cannot err in the statement that the erection of the proposed structure would be unwise, against the opinions and wishes of the

people of the two cities, and equally opposed to the prosperity and commercial importance of the State.

The great consideration that the bridge will be an obstruction to the free navigation of the harbor, is so overwhelming that it is almost unnecessary to refer to the details or statistics of property and trade sure to be injuriously affected if not utterly destroyed by its erection, including as it would the almost immediate abandonment by the government of one of its most complete naval establishments, justly the pride of the country, renowned in its history, and reliable in its greatest emergencies. The department through which the vast sums appropriated by Congress for the completion of this great naval establishment have been expended, cannot ignore its commanding location, its means for doing the work of the government, the cost of its removal, and the great interests, State and national, which would thereby be sacrificed. No advantages which are claimed to result from the proposed structure are to be found equal to justify a measure so unwise and destructive. If its effects were limited to the navy yard alone, and were in fact no detriment to the city of Boston itself, to Charlestown, and the already embarrassed commercial interests of the more inland cities and towns, the simple consideration that it destroyed one of the finest naval establishments of the country, for no adequate advantage to other interests, would be paramount against its erection; so that, equally destructive to the interests of the government and the interests of commerce, a scheme so fraught with injury to both cannot receive either the consent of the people or the countenance of the government.

We have said that there was no absolute demand for the Maverick bridge. East Boston is situated with regard to Boston proper precisely as the city of Brooklyn is with regard to New York—with this difference: the former may be reached by land conveyance through Charlestown and Chelsea from Boston, and the latter cannot be so reached, under any emergency, from New York. The ferry boats, in both cases capable of carrying everything that offers, ply regularly at all times of the day and night, at rates not higher than the average tolls of bridges; and if not ample to serve the demands of public travel and transportation, are easily to be increased. Nothing beyond East Boston, with a free route by land through Charlestown, would be materially benefited by the proposed bridge, but would participate in the general damage it would impose upon the commerce of the metropolitan city.

The harbor of Boston has heretofore been an object of consideration and care on the part of the general government, and large sums of money have been expended in its survey, in the exploration and preservation of its basins and estuaries, in the care of its islands and the maintenance of its channels, and at the present time is engaged in deepening them and removing obstructions which may impede or impair the commerce of the city. Yet it is apparent to the eye, even to the thought of all who know the topography of the inner harbor of Boston, that nature nor the power of the tempest, nor the washing away of the islands, has ever placed any obstacles to its free navigation for vessels of every tonnage equal to that contemplated by the erection of the Maverick bridge. It is in this sense a measure opposed to all improvement, rendering comparatively of little value all that has heretofore been done for the benefit of the harbor. It is as if an almost completed enterprise of gigantic magnitude and of immense utility for all coming time were to be blasted, or at least restricted, instead of being perfected. No filling up of basins, of estuaries, not even the filling up of the main channel of the harbor, would be so detrimental to the commerce of Boston as the building of

this bridge, for these would all be susceptible of remedy or removal, which a bridge, once built, would not be. There is no avoiding the conclusion that it would be an obstruction not to be abated by dredging nor removed by blasting; closing up for all time the largest, most important, and by far the most valuable portion of the harbor for all naval or commercial purposes.

But it is not alone any narrowness or obstacles in the channels, or any filling up of estuaries, that has engaged the attention of the government and people, but the restricted capacity of the harbor, the limited water frontage, and the still more stringent limit of deep-water accommodations, both for wharfage and anchorage, have demanded the attention of the civil authorities and the merchants. With a view to the extension and enlargement of these, various plans and large enterprises have been undertaken, and at the present time others, involving vast labor and considerable outlays, are contemplated by the authorities of the State, the particulars and details of which, though well known in this community, may be readily furnished. Under these circumstances, in view of the growth of the country and the expansion of its population over the vast areas of the west, in view of its increasing commerce with other countries, the vast accumulations of produce and manufactures to be exported, and the even greater quantities of manufactured goods and raw material to be imported to meet the growing demands of the country, when all the capacities of commerce, all the tonnage of the country, are sure to be required to meet the emergencies, it seems incredible that parties should be found, from whatever motive, who desire to abridge these means, or a legislature, acting for the interests of the whole people, that should afford them any encouragement.

The whole tendency of the measure proposed, ostensibly for the benefit of a small population justly seeking facilities which they deem advantageous, is to reduce absolutely and essentially the commercial advantages and the commercial importance of the city and the State, sacrificing the larger interests to the lesser, and the general interests of the whole to the private benefit of a few. To say that the true policy of the State, if anything pertaining to the policy of a thoughtful and nurturing government could have been recognized at all, is simply suicidal; is to characterize the act in the mildest terms of reproach. To-day, to-morrow, every day, the true interests of Boston, and therefore of the Commonwealth, and therefore of the nation, is to encourage, enlarge, and extend the commerce of the country, and by every means in the power of the government facilitate its transactions and promote its growth. No other policy can govern an intelligent and progressive people; no other policy can promote their prosperity, elevate their civilization, extend their influence, and promote the common welfare.

The portion of Boston harbor to be affected by the Maverick bridge is by far, for purposes of commerce, its most valuable portion.

Almost any number of bridges in the southerly section of the city, across the narrow channel which passes along its wharves, would be comparatively harmless compared with the one contemplated. From a point in the harbor near the end of Central wharf to the spacious basin lying between the northerly end of Boston, the city of Charlestown, the city of Chelsea, the distance is about 4,500 feet, by the chart, and in this space, with a width of about 1,500 feet, is the deepest water of the harbor, and the only part of the harbor, excepting the channel to the sea, where large vessels can lie at anchor. It is the opinion of Commodore Rodgers, commandant of the navy yard, that no large merchant ship or naval vessel can venture to anchor within 500 feet of the line of the bridge on either side, which, together with the width of the bridge and piers,

would take from the 4,500 feet of anchorage ground at least one-third of the whole, leaving the largest space above the bridge. It would thus not only almost destroy the proper but limited anchorage ground of the harbor for the larger class of vessels, but also leave by far the larger portion of the best wharf property of the city itself above the bridge. All the wharves of Charlestown, (at any one of which a man-of-war will float at low water,) all the wharves in Chelsea, and two-thirds of those at East Boston, together with the navy yard, would also be shut from any convenient access to the sea.

Nor is this all. The commerce of the city of Charlestown above the present bridges across the river, of the city of Cambridge, and towns on Charles river, is approximately represented by the statement that there are over 18,000 passages through the draws of these bridges per annum at the present time, and these, together with not less than 6,000 other passages of vessels going up to Chelsea, and thousands more to portions of Boston and East Boston, and the towns above, all of which would be compelled to pass through the draw or draws, for one draw would not accommodate the commerce the bridge would obstruct. Of the proposed bridge it can be no exaggeration to say, we think, that not less than three-fourths of the entire tonnage of Boston, foreign and domestic, reporting at the custom-house, would be compelled to pass through the draws of the Maverick bridge, should it ever be built. Thus, until the commerce of the port dwindles down to fishing vessels, the bridge itself could not accommodate the travel seeking to pass over it. How much the commerce of Boston and Charlestown would be likely to increase under these circumstances it would not be difficult to calculate; how rapidly it would diminish would be a still more obvious problem.

With respect to the removal of the navy yard, or its discontinuance as a government establishment, we presume either alternative to be dependent upon the free navigation of its waters, and the unobstructed access to its wharves and workshops, without which beyond question it would be comparatively worthless as a means of defence to the port. The Charlestown navy yard was one of the earliest foundations of the government preparatory to the creation of its great arm of national defence, now so efficient to the navy. The interest taken in the enterprise by the citizens of Charlestown at the time, and the sacrifices made by them in its behalf, were accepted as assurance of the patriotic feelings of the people and their devotion to the best interests of the country. We may add that the wisdom of the location, then made in the chief commercial port of the country, has been demonstrated through a series of 70 years, and by the large sums of money expended by the government for its completion and the development of its capacities, so that to-day, unless we have been misadvised, the Charlestown navy yard may safely challenge comparison in many important particulars with any similar depot in the world. Its spacious dock, its foundry, ropewalk, (all of which are believed to be unsurpassed,) its shiphouses, workshops, storehouses, are available to an extraordinary extent by their very compactness as well as by their complete and substantial character.

To destroy such an establishment—the growth of nearly three-quarters of a century under the most liberal appropriations of the government, now representing tens of millions of dollars in its real property and materials, completed and almost perfected in some of its departments, capable of meeting, as it has already met, the most pressing demands of the government—seems so unwise and ill-judged that we do not know how to characterize it by any simple epithet in the language; and, we presume, under other circumstances, would never be contemplated by the government. It seems almost impossible that such a result of

the legislature of the State could have been considered, and we do but repeat a large public judgment when we say that intelligent gentlemen are unwilling to believe, even with the act before them, that, unopposed and unexposed, it can ever be accomplished.

To create such an establishment, to say nothing here of its location, of the facilities for transportation with all parts of the country by railroad conections, and its ready means of obtaining supplies, has been the work of two generations. Its destruction by an act of questionable policy and certain injury is not a matter to be lightly considered or capriciously disposed of; it is, in fact, a question of great interest to the State and the nation. The navy yard has become identified, not merely with the city of Charlestown, or the city of Boston, but with the Commonwealth of Massachusetts, and all her interests, manufacturing and commercial; and she has a right to look upon it as one of the evidences of her importance, and the means of her defence. Its establishment was a compliment to her position and services, her commercial importance and growing greatness. Without presuming to urge her claims upon the general government, we may be allowed to say that she has done nothing, unless it be the act which we condemn, to forfeit its regard or confidence.

Entertaining these views of the questions in common, we believe, with the mass of our people, and feeling how deeply the determination of them will affect a large portion of our communities who are, from their position, wholly uninformed in regard to them, we have felt it to be due to them, just and proper on our part, and respectful to the head of the Navy Dapartment of the country, to present them in this form.

We remain, honored sir, with assurance of our high consideration and respect, your obedient servants,

LIVERUS HULL,
Mayor of Charlestown.
HENRY LYON,
WM. W. WHEILDON,
EDWD. THORNDIKE.

Hon. GIDEON WELLES,
Secretary of the Navy.

JUNE 26, 1868.

Alderman Trent offered the following preamble and resolve, viz:

Whereas, by a recent act of the legislature of Massachusetts, authority was given to construct a bridge from the city of Boston proper across the harbor to East Boston, the same being subject to the approval of the Congress of the United States; and whereas the construction of the said bridge would be in the highest degree *detrimental* to the general interests of the city of Charlestown, to the property in its limits bordering on the harbor, and to the trade and prosperity of a large portion of its people: Therefore,

Resolved, That his honor the mayor be requested and authorized to take all necessary measures for the representing of these facts before the Congress of the United States, and of opposing and defeating, if possible, the said project.

Preamble and resolve adopted unanimously, and sent down for concurrence. Came back concurred. Copy of the record.

A true copy. Attest:

DANIEL WILLIAMS, *City Clerk.*

COMMONWEALTH OF MASSACHUSETTS—IN THE YEAR ONE THOUSAND EIGHT HUNDRED AND SIXTY-EIGHT.

AN ACT to incorporate the Maverick Bridge Company.

Be it enacted by the senate and house of representatives, in general court assembled, and by the authority of the same, as follows: SECTION 1. Gilbert E. Pierce, Nehemiah Gibson, Samuel Hall, Nathaniel McKay, Charles R. McLean, Jeremiah H. Pote, Abraham S. Foss, their associates and successors, are hereby made a corporation by the name of the Maverick Bridge Company; with all the powers and privileges, and subject to all the duties, liabilities and restrictions set forth in the sixty-eighth chapter of the general statutes.

SEC. 2. The said corporation is hereby empowered and authorized to erect a bridge over the water between the mainland in the city of Boston, and East Boston, and to purchase or otherwise take and hold such real and personal estate as may be proper for that purpose, except that the property of the East Boston Ferry Company and that now used by them shall not be so taken, unless the said city shall so direct, and shall permit the said ferry company to run their boats between the landings formerly occupied by the People's Ferry Company, free of charge and keeping the same in repair; and in that case said East Boston Ferry Company are hereby authorized to run their ferry between said landings. The capital stock of this company shall not exceed fifteen hundred thousand dollars, divided into shares of one hundred dollars each.

SEC. 3. The said corporation shall be holden to make compensation to any person or corporation whose real estate shall be taken for the uses aforesaid, and if there shall be a difference of opinion as to the value of the same, the said corporation shall pay therefor such damages as shall be estimated by the board of aldermen of the city of Boston, and either party, if dissatisfied with their estimate, may apply to the superior court next to be held within and for the county of Suffolk, after said estimates shall have been made known to them, and thereupon the same proceedings shall be had as in case of estimating and enforcing payment of damages for laying out ways in said city of Boston.

SEC. 4. The said corporation shall construct the piers of said bridge of such materials, size, shape, direction and position respecting currents and channels, and the said bridge with a draw at right angles with the channel as near as may be, and with such accommodation for the passage of vessels through the same, as the mayor and aldermen of the said city of Boston, on consultation with the harbor commissioners, shall direct or approve; but substantially in conformity to the single-draw plan of T. Willis Pratt, or such improvements as may be made thereon; and in all other respects shall construct the same to the approval of said mayor and aldermen; and shall provide and maintain a suitable steam tug-boat, or such other aids to the passage of vessels through the draw of said bridge, and for other purposes, as the said mayor and aldermen shall from time to time direct.

SEC. 5. The said corporation shall be allowed to collect and receive such tolls as the said mayor and aldermen shall from time to time determine: *Provided, however,* That the rates of toll shall never, without the consent of said corporation, be so much reduced as to reduce the yearly dividends of said company to an amount less than eight per cent. on the amount of capital stock actually invested; except that the same may be so reduced by said mayor and aldermen, if in their judgment the public interests shall require it, the said city making up the amount of said

deficiency. Such right to collect and receive tolls to commence on the day when the said bridge shall be opened for public use, and to continue for the term of fifty years next thereafter; and at the place of receiving said tolls there shall be constantly exposed to view a sign-board, with the said rates of toll fairly and legibly exhibited thereon.

SEC. 6. The said corporation shall cause to be kept regular books of account, in which shall be entered full, true, exact and plain statements of all the expenses of building the said bridge, and of furnishing and equipping the same, and also a true and accurate account annually of all receipts and disbursements on account of the same, and of keeping it open and in order for public travel, which books of account shall be at all times open to the inspection of said mayor and aldermen, or of any committee thereof, and a copy of said accounts shall be made annually in the month of January, and under oath of the president and treasurer of said corporation, to the board of aldermen of said city of Boston, to and including the thirty-first day of December in each year, and a duplicate copy of the same annually filed in the office of the secretary of the Commonwealth.

SEC. 7. Whenever the receipts of said corporation shall have reimbursed to said corporation the moneys expended by them in the construction of said bridge, its furnishings and equipments, and in keeping the same in good repair and condition, with interest on said expenditures at the rate of eight per cent. per annum, the said corporation shall thereupon immediately in writing notify the said board of aldermen of said city of that fact, and shall thereupon offer the said bridge, its furnishing and equipments, to be surrendered to the said city of Boston, to be, and if accepted by the said city the same shall be, forever thereafter maintained as a free bridge by the said city at the public expense.

SEC. 8. The said city of Boston is hereby authorized, if they shall so elect and determine, by a major vote of the two branches of the city council, in concurrence, to assume and take the franchise granted by this act, with all the rights and privileges belonging to the same, and shall thereupon proceed forthwith to construct the said bridge as a free bridge, at its own expense and for that purpose shall have authority to issue from time to time coupon bonds, notes, scrip, or certificates of debt, as said city council shall, by major vote thereof, fix and determine.

SEC. 9. The said city of Boston, by a vote of the city council, as aforesaid, may, at any time during the continuance of this charter, purchase and take of said company the said bridge and all the franchise, rights, privileges, and property of the said company by paying or offering to pay them therefor such sum as will reimburse them the amount of moneys expended by them in and upon said bridge, its furnishings, equipments, and repair, as aforesaid, with eight per cent. interest thereon, and less the net profits of said corporation from tolls, as aforesaid, and for that purpose shall have authority to issue from time to time bonds, notes, scrip, or certificates of debt, as hereinbefore provided; and upon such payment or offer of payment the said corporation shall forthwith, by proper instruments of title, surrender and convey to the said city the said bridge, with all the franchise, rights, privileges, and property to the same appertaining, and the said bridge shall thereafter be maintained and kept by said city as a free bridge, at the public expense, as aforesaid.

SEC. 10. The said city of Boston, by a vote of the city council, as aforesaid, may assume and take, or purchase of said company, the said bridge and other property, as hereinbefore provided, and have and exercise all the rights, powers, and authority given to said company by this act, and subject to all the duties, liabilities, and restrictions herein

contained, in such manner and by such agents, officers, and servants as the said city council shall from time to time ordain, appoint, and direct; and shall have a right to collect and receive the same rates of toll as are allowed by the fourth section of this act to said company: *Provided*, that whenever from the tolls collected on said bridge, or from other sources, the said city shall have been fully reimbursed all outlays and expenditures on account of said bridge, and the operation of the same, then the tolls on said bridge shall cease, and the said bridge shall ever after be maintained by said city as a free bridge.

SEC. 11. If said corporation or said city, as the case may be, shall neglect for the space of five years to build and finish the said bridge, then this act shall be void.

SEC. 12. Whenever $200,000 of said capital stock shall have been actually paid in in cash, the said corporation may issue its bonds for an amount not exceeding the residue of its capital stock, at a rate of interest not exceeding eight per cent. per annum, and not exceeding 50 years to their maturity, and secure the same by a mortgage of the said bridge, furnishings and equipments, and of the franchise and privileges thereto appertaining.

SEC. 13. When the said bridge company shall have built the said bridge, they shall offer in writing, to purchase of the East Boston Ferry Company the boats, with their appurtenances, then in use by them for ferry purposes; and in case the two parties fail to agree upon the terms of said purchase, the supreme judicial court, in term time or vacation, shall, on the application of either party, appoint three commissioners to appraise the same at their fair valuation for ferry purposes, and shall fix the terms of purchase thereof; and if the same shall be accepted by said ferry company, they shall thereupon cease to run and maintain a ferry between said Boston and East Boston, and the same shall thereafter be run by said bridge company, with all the rights and privileges now had and enjoyed by the said East Boston Ferry Company; but if the said ferry company shall refuse to sell as aforesaid, the said bridge company shall be held to no further obligations hereunder. And if said bridge company shall fail to pay to said East Boston Ferry Company the amount awarded by said commissioners within 90 days after their award shall have been accepted by the said court, then this act shall be void.

SEC. 14. This act shall take effect upon its passage.

SENATE, *May* 29, 1868.

Passed to be engrossed. Sent down for concurrence.

S. N. GIFFORD, *Clerk.*

COMMONWEALTH OF MASSACHUSETTS.

EXECUTIVE DEPARTMENT,
Boston, June 11, 1868.

To the Honorable Senate:

I herewith return to the senate, in which it originated, a bill entitled "An act to incorporate the Maverick Bridge Company," which I am unable to approve. The late period of the session at which this very important measure has been enacted—at a time, too, when numerous other enactments of great importance are presented to the executive for revision, the consideration of which requires time for proper investigation—prevents me from making to your honorable body so full a

statement of the reasons which compel my dissent from this bill as would otherwise have been possible. Passing by, therefore, various minor objections to details of the bill, which, under other circumstances, I should suggest to your attention, the main reasons which compel my dissent are mainly these:

First. I am not satisfied that the proposed structure will not lessen the depth of water in the ship channels of the harbor by shifting the places of deposit of the material which is brought down by the tidal and river currents; and without being so satisfied I can under no possible circumstances approve of its erection.

I am advised by Professor Benjamin Pierce, the director of the United States Coast Survey, (whose capacity to pass an intelligent judgment on the question is indisputable, and who, as a citizen of Massachusetts, long residing in the immediate vicinity of Boston, can have none but the true interest of the commercial capital at heart,) that such, in his opinion, will be the result. And I am further advised that such also is the opinion of other eminent scientific authorities. I have no need to enlarge on the detriment which the structure will produce to the welfare and importance, not only of Boston and Massachusetts, but of all New England, if it shall be erected and be found to cause such an effect. The local benefits which it would confer would be but slight compensation for the misfortune of shoaling, by ever so few inches, our harbor channels.

Second. I am advised by large deputations of eminent merchants of Boston and its vicinity that the proposed structure will injure the maritime commerce of the capital in various ways, among which are the following:

1. By lessening the anchorage ground in the harbor, which is already very limited.

2. By diminishing the area of wharfage at and near both termini of the bridge. And I desire to call your attention to the fact that the bill does not designate the points of termination of the bridge on either side of the harbor, but leaves to the option of the corporators the selection of them anywhere along a line of several hundred yards on each shore.

3. By diverting foreign commerce to other localities, perhaps to other ports, as the wharves now principally devoted to that branch of our trade, which is carried on in vessels of the greatest draught, are situated above any line on which it is probable that the bridge would be built.

4. By the diminution of all the various and extensive trade along the shores of Boston, Charlestown, Chelsea, and Cambridge, which lie above the bridge, certain to result from interposing such an obstacle, which, according to this bill, is not to be raised to a height sufficient to permit the free passage of any class of vessels, but is to be traversed by them only by means of a draw.

Third. I am informed by the commandant of the navy yard at Charlestown that certainly the interests, and, in his opinion, the rights of the United States in that establishment will be infringed by such a structure.

Fourth. The harbor commissioners of the commonwealth, and the distinguished military and civil engineers who are engaged on the public works in the harbor, are unanimous in condemning the project as injurious on the foregoing and on other grounds; and to their judgment, in a matter so directly within the province of their investigation, I am constrained to render great deference, since I cannot regard it other than intelligent and impartial.

It is said that there are grave constitutional objections also to the

assumption of power by the legislature of a State to authorize such an erection over navigable waters. But in the light of the decision of our supreme judicial court, in the case of the Commonwealth *vs.* The Proprietors of the New Bedford Bridge, 2 Grey's Reports, pp. 346, 347, I do not doubt our right and power over the subject, provided our enactments do not interfere with the regulations of Congress; and neither can I doubt the right and power of Congress to interpose at its discretion, and overrule the legislation of a State. Nor have I doubt that, if this bill shall, by your action, become a law, the interposition of Congress will be sought; and, even if the structure were otherwise unobjectionable, I respectfully suggest whether, as the interests and rights of the federal government, not only as the guardian and regulator of commerce, but as itself the actual owner of an immense property at Charlestown and Chealsea and Watertown, are directly affected by the question, it would not be a suitable course to seek first the opinion of Congress as a guide to the legislation of the commonwealth.

Suggestions have been made from respectable and intelligent sources, that this measure has been precipitated, and that the executive sanction should be withheld from the bill in order to make delay, because the merchants of Boston have not believed that it was a serious project, and therefore have neglected to remonstrate with the legislature concerning it as they otherwise might have done, and as it is represented they will do in the future. I hardly need to remark that to such suggestions I give no consideration, and that they deserve none; in the first place, as conveying an unjustifiable imputation on your honorable body; and in the next place, because no class in the community has any right to appeal to the executive for protection against its own negligence. I rest no objections to the bill on such grounds.

But in reference to a matter of such vast importance, which affects directly or indirectly the value of at least a hundred million dollars' worth of property along the shores of Boston and neighboring cities; enhancing it in some quarters, diminishing it in others; which brings us into positive conflict with the Navy Department of the United States, and into possible conflict with Congress; which is disapproved by the harbor commissioners and the engineers employed in the harbor of Boston; which is condemned by certainly a large part of the mercantile community as, on the whole, more injurious than beneficial, apart from any consideration of its effect on the depth of water in the channels; and which, more than all, in the judgment of competent scientific authorities, will result in shoaling the whole harbor; I am unable to give my approval without further discussion and further information to enlighten my judgment than is now possible without delay.

I fully appreciate the local benefits which are expected to result from it to East Boston. I wish, for the prosperity of that locality, that it were possible to attain those benefits in some other way than at the risk of great injury to a community embracing more than the whole of this Commonwealth, and of which the people of East Boston are but a small fraction. But as, after such investigation as I have been able to make, such injury seems to be a probable result of the measure, I cannot give it my assent.

If, upon reconsideration, the general court shall be led to give such weight to these opinions as to concur in a postponement of the enterprise, I trust that I may not be considered to exceed the limits of executive revisal in respectfully suggesting that the bill be referred to the next legislature, and that a commission be specially appointed, or the duty imposed on some existing commission, to investigate meanwhile and re-

port next January upon all the grounds on which the project is now either opposed or advocated. Possibly also Congress, at its present session, might think advisable to appoint a commission in behalf of the United States to act in concurrence with our own. And if, in the light of the report of such a joint commission, the objections which it has been my duty to set forth shall be shown to be groundless, the measure can then be carried into effect with confidence in its beneficial results.

ALEXANDER H. BULLOCK.

CITY OF CAMBRIDGE, MAYOR'S OFFICE,
September 24, 1868.

GENTLEMEN: The undersigned, in behalf of the city of Cambridge, would beg leave respectfully to make the following statement of facts in relation to the matter now in hearing, viz: That the city of Cambridge has a water front on Charles river of upwards of five miles, and consequently is largely interested in wharf property and heavy business connected therewith which is dependent upon the free and unobstructed navigation of said river and the harbor of the city of Boston, and that any additional obstruction will operate not only to increase the cost of every material transported by water, now consisting largely of supplies of lumber, coal, wood, pig iron, lime, grain, salt, stone, &c., but will operate to preclude and hinder the prosecution of said business, and thus in a great measure annihilate an immense and daily increasing trade, which the necessities of the second city in the State in wealth demand and require. That the construction of this bridge will tend, during a portion of the year, to place an embargo between the Charles River bridge and the one now proposed of ice, which rarely, if ever, now occurs. In short, the positive injury that will be inflicted upon our commerce, should this project be carried out, is so apparent that I trust that the brief statement submitted below of the approximate value of said trade will satisfy your honorable board that the effect of this project, if carried out, upon the trade and property owned in our city but dependent solely upon water communication with the sea, is fairly stated, and that the figures are below, rather than above, the real amount. It is impossible to give you in figures the actual damage to a trade of this description to a city so favorably located as Cambridge, and I submit without comment the following information obtained from the affidavits of the assessors of our city and other officers specially detailed to obtain them:

The number of vessels arriving annually at our city is about 1,500; the estimated value of wharf property now in use, including the buildings thereon, is $2,000,000; the amount of business connected therewith is estimated at $5,000,000; the amount of coal shipped annually is estimated at 1,000,000 tons. A very large amount of lumber, lime, and other raw materials are received by water to supply our many large manufacturing establishments which it is impossible to enumerate. We have a single establishment whose business, I am informed, amounts to $1,500,000. The valuation of our city is upwards of $33,000,000, and our annual increase is about ten per cent. With our extensive water frontage, and the above amount of wharfage and property already enumerated above, I feel sure that I need not say more to convince this

commission that this enterprise strikes a fatal blow to this branch of our prosperity.

I remain, very respectfully, yours, &c.,

CHAS. H. SAUNDERS,
Mayor of said City of Cambridge.

Rear-Admiral S. H. STRINGHAM, CHAS. H. BELL,
and Brevet Brigadier General J. H. SIMPSON,
Honorable Commissioners appointed under the resolve of Congress in relation to the erection of the proposed Maverick bridge, now in session at the navy yard at Charlestown, Massachusetts.

H.

Remonstrance of mayor and citizens of Cambridge against the building of bridge.

To the commissioners appointed under act of Congress relative to the erection of a bridge across the harbor between Boston and East Boston :

Respectfully represent the subscribers, owners and occupants of wharves in the city of Cambridge, that their property would be damaged by the construction of said bridge, and they believe that all similar property above said bridge would also be depreciated; that the proposed bridge is not demanded by any great public necessity, it being only for the purpose of connecting one ward (an island) with the rest of the city of Boston; and that the damage to the shipping and commercial interests of Boston and other neighboring cities will far outweigh any advantage which may result from the construction of said bridge. They therefore most earnestly remonstrate against such construction.

JOHN B. WINSLOW, *Superintendent Boston and Lowell Railroad.*
JAMES ELLISON, *President of New England Glass Company.*
THOMAS DANA, *President of Bay State Glass Company.*

FLINT & HALL.
W. S. BLANCHARD & CO.
WM. C. BROOKS & CO.
K. S. CHAFFEE,
Treasurer Union Glass Co.
WM. WYMAN.
WELLINGTON BROS.
BURRAGE, SHEPHERD & CO.
M. L. SMITH.
LUKE & BENT.
CHAS. W. MUNROE.
EMERY WILLARD.
BENJ'N G. SMITH.
PACKARD & SHAW.
J. BALDWIN, JR.
GALE & RUSSELL.
HOLMES & RUGG.
APPLETON HUBBARD.
W. T. RICHARDSON.
NEWELL BENT.
A. C. SANBORN & CO.
HOWLAND & DOUGHTY.
DANIELS & CO.
OLIVER HASTINGS.

CAMBRIDGE, *September*, 1868.

1.

Brevet Major General J. G. Foster, U. S. A., in charge of preservation, &c., of harbor.

HOUSE OF REPRESENTATIVES, 40TH CONGRESS,
Washington, D. C., June 22, 1868.

SIR: The legislature of Massachusetts has authorized a bridge to be constructed from Boston to East Boston, across the harbor below the navy yard. A bill giving the assent of Congress to the erection of such bridge has been referred to the Committee on Roads and Canals. If there is any evidence in your department or within your control which will show the committee what would be the effect upon the navigation of the harbor, the area of anchoring ground, or upon the rights and interests of the United States in the Charlestown navy yard, you are requested to furnish such evidence to the committee.

I am, very respectfully, your obedient servant,
BURTON C. COOK, *Chairman.*

Bvt. Maj. Gen. A. A. HUMPHREYS,
Chief of Engineers.

HEADQUARTERS CORPS OF ENGINEERS,
Washington, D. C., June 24, 1868.

GENERAL: Enclosed is a copy of a communication received from the chairman of the Committee on Roads and Canals of the House of Representatives, in relation to the proposed bridge between Boston and East Boston.

You will please report as fully as possible upon the points of inquiry therein contained, giving all facts you may deem important to lay before the committee to show the danger to navigation and to the interests of the United States of such a structure as the bridge proposed.

I am, very respectfully, your obedient servant,
A. A. HUMPHREYS,
Brigadier General Com'dg.

Lieut. Col. and Bvt. Maj. Gen. J. G. FOSTER,
Corps of Engineers, Boston, Mass.

BOSTON, MASS., *September* 26, 1868.

GENTLEMEN: I forward to you a copy of my letter to the Chief of Engineers, dated June 30, 1868, giving my views as to the effect of the bridge proposed to be built by the Maverick Bridge Company from Boston proper to East Boston.

Since the date of that report no new facts have come to my knowledge. The information contained in the sketches referred to in the report is contained in the sketch herewith enclosed.

I also enclose a copy of the communication of the Chief of Engineers in answer to which my report was made, as well as the act of incorporation and the governor's veto message referred to in my report to the Chief of Engineers.

I remain, gentlemen, very respectfully, your obedient servant,
J. G. FOSTER,
Brevet Major General U. S. A., Lieutenant Colonel Engineers.

The ARMY AND NAVY COMMISSION,
Navy Yard, Boston, Massachusetts.

BOSTON, MASS., *June* 30, 1868.

GENERAL: I have the honor to acknowledge the receipt of your letter of June 24, enclosing a copy of a communication from the chairman of the Committee on Roads and Canals of the United States House of Representatives, in relation to the proposed bridge between Boston and East Boston, and directing me to report as fully as possible upon the points of inquiry therein contained.

In accordance I have the honor to report as follows with respect to the effect of the proposed bridge:

First. As to "the effect upon the navigation of the harbor." The plans of Mr. T. Willis Pratt, mentioned in the act "To incorporate the Maverick Bridge Company," (copy enclosed,) contemplate the construction of a wire suspension bridge, resting upon three or four large piers of masonry. The bridge is to have a pivot draw of 380 feet in length, thus allowing a passage on each side of the pivot pier of 150 feet. It is proposed to open and close this draw by machinery, and also to employ a steam tug to facilitate the passage of vessels.

The records of the draw-keepers at the bridge across Charles and Mystic rivers give the following as the number of vessels that have passed in the last year:

	Openings.
Chelsea bridge, south draw	5,400
Chelsea bridge, north draw	1,250
Meridian street bridge, East Boston to Chelsea	1,336
Charles river bridge, Boston to Charlestown	8,500
Total openings of draws in one year	16,486

The number of vessels that pass the line of the proposed bridge, going to the wharves in Boston, Charlestown, East Boston, and Chelsea, is at least equal to the above number that pass draws, viz: 16,486; giving the number of vessels that will pass the draw of the proposed Maverick bridge as 32,972. The draw-keepers report that the time occupied by the vessels, which are schooners and others of light draught, in passing their draws varies from 2 to 15 minutes, and averages at least 5 minutes. At the new railroad bridge across the Merrimack at Newburyport the time occupied in merely opening and closing the draw of 190 feet in length, without waiting for the passage of a vessel, is 4½ minutes.

The vessels that are to pass the Maverick bridge are the largest that enter the harbor, being those of the India trade and others of equally heavy tonnage that have their wharves in Boston, from Battery wharf around to the Charles river bridge, and the vessels of war of the navy. These heavy vessels, difficult of navigation at the best in a limited space, will be still more difficult to manage in passing the draw at the low rate of speed necessary to guard against serious accidents, and in the increased velocity of the currents caused by the piers. It is not unreasonable, then, to estimate that with all the advantages of steam in manœuvring the draw and towing vessels through, the time consumed in opening the draw, passing the vessel, and shutting it will be at least five minutes.

This will amount to 164,860 minutes in the year, or 452 minutes—7 hours and 32 minutes—in each day. The transit across the bridge will thus be interrupted for nearly eight hours each day, and will consequently almost totally interrupt travel. This is supposing that the transit is made subordinate to the passage of vessels. But the same inter-

ests that have carried the necessary bill through the legislature and brought it before Congress may be able to cause the passage of vessels to be made subordinate to the transit across the bridge, and to limit the time for the opening of the draw and passage of vessels, and even to terminate in establishing a closed bridge. Whether it be ever carried to this extent or not, it is evident that the proposed bridge will be at the best a serious obstruction to navigation, not only in the time that will be consumed in passing the draw, but in the positive dangers resulting to vessels from collisions with each other or with the piers or draw of the bridge.

A heavy frigate striking a pier while passing at a speed of four miles an hour would have momentum sufficient to overturn it, but at the same time it would probably be itself crushed in and sunk.

Every bridge is more or less an obstruction to navigation, but in this case, with a bridge across the best and most frequented part of the harbor, over a part of the best anchorage ground for heavy vessels, and on a line across which pass daily 90 vessels, the majority of which are of great tonnage, engaged in the foreign trade, or United States men-of-war, the obstruction becomes greatly aggravated, and of serious and almost fatal effect.

The space occupied by the piers will cause a corresponding diminution of the water-way, and an increased velocity of the current immediately between the piers. This will scour out the material to the distance from the bridge where the original velocity of the current is resumed. I calculate this increase of velocity at the bridge to be four-tenths of a mile an hour, and that the scourings will be deposited within 2,000 feet. This unfortunately will place the deposit of the ebb tide in that position of the anchorage which is now the most valuable for heavy vessels, being the deepest, so that ultimately this deep and valuable portion may be filled up so as to be no longer of the requisite depth for this large class of vessels. This would be an injury to the navigation of the harbor, the extent of which can hardly be estimated.

2. As to "the area of anchorage ground," it will be seen by the sketches enclosed that the area of anchorage ground for large vessels, lying within the five-fathom curve, extends from a short distance above the most northerly of the proposed positions for the bridge to some 1,500 feet below the most southern position. In either of the proposed positions it will pass over a portion of the best anchorage ground in the harbor.

Allowing 40 fathoms scope of chain for a vessel of the Dictator class, which is considered absolutely necessary by pilots, and a length of 324 feet, which is the length of the Dictator, it will require an area of 584 feet radius to allow such a vessel to swing to her cable, but as no vessel should be anchored so as to strike the bridge in swinging, or in case of the Dictator, within 584 feet on either side, the proposed bridge will take from the available anchoring ground for large vessels $[584 \times 2 + 40] \times 1500 = 1{,}812{,}000$ square feet, or nearly 2,000,000 square feet of the best anchoring ground in the harbor.

This takes nearly one-half of all the available anchorage ground for the heaviest class of vessels, as will be seen from the inclosed, within the five-fathom curve on the sketch; and even the remaining space for large vessels will be further limited in time by the deposition of the scourings between the piers of the bridge, as described above.

3. As to the effect "upon the rights and interests of the United States in the Charlestown navy yard," I enclose a copy of "an act authorizing the United States to purchase a certain tract of land in Charlestown for a navy yard," passed by the Massachusetts legislature June 17, 1800.

Under this the land has been acquired, the buildings and wharves constructed at an expense of about $30,000,000.

The value of this property as a navy yard will be vastly diminished by the proposed bridge, which will so impede the ingress and egress of vessels of war as eventually to force the government to remove the yard to some more accessible harbor.

The United States would thus, in addition to being deprived of its right to pass freely to and from the ocean which it had at the time of the establishment of the yard, be also forced to relinquish a portion of its property and all the advantages of the establishment as a complete depot of stores and equipments. Even if it be retained as a navy yard after the proposed bridge be constructed, its value will be largely reduced. No vessel can pass to or from the yard without detention, and, possibly, serious damage.

In time of war these delays and damages may prejudice operations to an extent that can hardly be estimated, but which must be very great; and if at a critical moment a secret enemy in our midst should blow the draw into the stream, its removal would delay the passage of every man-of-war for weeks. Such a delay at a preconcerted moment might jeopard the loss of a fleet, or the safety of a city from bombardment.

As a local measure, the construction of the bridge will have the effect to enhance the value of property in East Boston, and to reduce the value of property in Charlestown and Chelsea, and especially the wharf property in Boston west of the proposed bridge. The general effect will, therefore, be simply to transfer a portion of the money value of property from one section to another—taking from the property holders of Boston and Charlestown to give to those in East Boston.

I enclose with the copy of the act to incorporate the company to build the proposed bridge, which was finally passed over the governor's veto, a copy of the veto, in which Governor Bullock gives many excellent and strong reasons for his dissent to the measure.

The board of harbor commissioners are also decidedly opposed to the construction of this bridge, believing it to be injurious to the navigation of the harbor and to the interests of commerce.

It is a singular coincidence that while the United States is expending nearly half a million of dollars in the preservation and improvement of the harbor, and in removing obstructions from its channels, the State should authorize the construction of a greater obstruction, and one especially detrimental to the rights and interests of the United States.

I have the honor to remain, general, very respectfully, your obedient servant,

J. G. FOSTER,
Bvt. Maj. Gen. U. S. A., Lt. Col. Engineers.

Brevet Major General A. A. HUMPHREYS,
Chief of Engineers, Headquarters Corps of Engineers,
Washington, D. C.

J.

The Fitchburg Railroad Company, remonstrants against the bridge.

GENTLEMEN: The commerce of a country, if not the very basis of its wealth and prosperity, is one of the most important means of both, and in this is found the reason why all the great interests in this part of the Commonwealth, even to a greater distance from Boston than at first

appears, are opposed to the creation of a barrier, whatever may be its peculiar character as to form or structure, across an important portion of Boston harbor. Not only the immediate interests of navigation, wharf property, ship-building, and the trades, employments and traffic attendant upon these, but large producing, manufacturing, warehousing and transportation interests, near and remote, are equally opposed and almost equally to be prejudiced by the obstruction to commerce contemplated in the grant for the erection of the Maverick bridge. Whatever may be said to the contrary, these all regard an additional impediment to the navigation of Boston harbor as a measure fraught with trouble, delay, expense and danger, to be annually increased if commerce increases; to be tediously endured if commerce should, as it most probably would do, diminish under the annoyance and cost.

The members of the commission must have observed since their arrival in this vicinity, if not before known to them, that four of the great railroad lines of Massachusetts, starting from Boston, cross Charles river, above two or more of the present bridges, and are in some sense as long warves to the interior towns in northerly, northwesterly, and northeasterly directions. These railroad lines are the Fitchburg, Boston and Maine, Eastern, and Lowell. Their passenger dopots and freight houses are in the city of Boston, except the Fitchburg road, whose freight houses are in Charlestown, and the Eastern, whose freight-houses are at East Boston; but a large portion of their heavy freighting is done on their wharves and roadways in Charles river, and cannot be done with the same convenience and facilities in any other place. It will appear by statements which will be presented to the board that not less than 1,000 cargoes of freight of the most bulky merchandise, which could not possibly be accommodated in any other part or portion of Boston harbor, at however much additional cost of wharfage, transportation and delivery, are annually landed on these wharves and forwarded by railroad trains to Lowell, Lawrence, Fitchburg, and numerous other towns in and beyond the borders of the State. This great commerce is carried on almost entirely by coasting vessels, comprising barks, brigantines, three-masted schooners, and schooners, and consists chiefly of coal, lumber, lime, salt, plaster, pig iron, bricks, sand, stone, &c., and occasional cargoes of railroad iron. These vessels are now compelled to pass through two, three, four and five bridges, viz: Fitchburg, 522, through two bridges; Boston and Maine, 226, through three bridges; Eastern, through four bridges; Lowell, through five bridges. To accommodate the 512 vessels which landed cargoes on the Fitchburg wharves in 1867, the draws of the two bridges were required to be opened 1,024 times each, or together 2,048 times. Of these 512 vessels, 204 had cargoes of coal, the price of which was increased to the consumer by the charge of 3 cents per ton for each bridge, making the amount paid for that year on the article of coal alone, delivered on the wharves of the Fitchburg railroad, $4,564 52. For the same amount delivered to the Boston and Maine road the charge would be $6,846 28, and if at the Lowell railroad it would amount to $11,413 80. These charges, of course, are to be met annually and perhaps increased annually. The proposed bridge across the harbor, if erected, would have the effect largely to increase these amounts per year, for, whatever means were adopted to facilitate the passage of vessels through the draw, there would inevitably be much delay, both from their number and from the necessity of making sail amidst baffling winds towards the first bridge over Charles river; or if steam-tugs were employed for this purpose the cost of the cargo, whether of lumber or coal, would be considerably increased, so that a bridge so far

below any of the present bridges could not be passed by vessels going further up at the ordinary rate of three cents per ton for coal, and charges for other cargoes proportional to that; the shippers' charge could hardly be less to cover expense and delay than four times three cents, and would inevitably prove, in the case of vessels bound to the limit of navigation, absolutely prohibitory. It could, judging from the data presented, hardly be otherwise than destructive to this branch of commerce on Charles river. Without any additional obstruction to navigation in the harbor or river, the increase of commercial business connected with the Fitchburg railroad is stated by the superintendent of that road to be 10 per cent. for the past year, which would make the number of cargoes for this year about 563, and the same rate of increase would double the number in about seven years. No such annual increase as this could be calculated upon if the proposed obstruction should be placed across the harbor. The Fitchburg railroad is 50 miles in length and has a capital stock account of over three and a half millions of dollars, and carries over its road more than half a million tons of merchandise per annum. The interest of this great corporation in the free navigation of the harbor is further increased by the fact that its freight track has been extended along all the deep water wharves in Charlestown below the bridges, and into and through nearly the whole length of the navy yard, which extension is mentioned in the annual report of the corporation for the year 1853, herewith submitted, as follows:

> By a legislative act of 1862, the corporation was authorized to extend its railroad from its then terminus east of Warren avenue in Charlestown, to the bounds of the navy yard in that city. Subsequently by orders from Washington the railroad was ex ended into the navy yard, so that the munitions can now be delivered by continuous railroad from any of the New England States, the State of New York and the west, into the great naval depot of the United States in the east. Furthermore, by this extension about all the deep water in Charlestown can also be reached by the railroad, which, with the spacious wharves for vessels of the larger burthen that line the shore at this locality, will enable shippers to transfer merchandise direct from cars to the ship, [as well as from the ship to the cars.]

These tracks, as stated by the directors of the corporation, connect with the wharves above the navy yard and below the Charles river bridge, and provide transportation for all the ice that is shipped from Charlestown, which is well known to be a large and increasing and important branch of commerce. The importance of the connection of this road with the navy yard is, beyond question, a fact which will be duly appreciated by the commissioners in connection with the free navigation of the harbor. It is also to be stated in this connection that a branch of the Fitchburg railroad, known as the Watertown branch, connects the United States arsenal at Watertown with the navy yard, and of course with the harbor, and by means of the harbor with the forts for its defence. It is not necessary before this commission to enlarge upon the importance of these significant connections with the naval and munitionary establishments of the general government.

It will be seen by the statements here made, together with a knowledge of the extensive wharf property of the Fitchburg railroad, how largely the interests of this corporation, and the vast inland traffic provided for by its tracks, are connected with the free navigation of Boston harbor, and how disastrously these would be affected by any further obstructions to the commerce of the port. The Fitchburg road is in fact the great wharf of a large section of the commonwealth of Massachusetts, and to a considerable extent, by its interior connections, of portions of the States of New Hampshire and Vermont.

Annexed hereto is a statement from the superintendent of the Fitchburg railroad, showing the number of cargoes landed on their wharves

in 1867 to be five hundred and twelve, (512,) of which two hundred and four (204) were cargoes of coal, every ton of which was subjected to a bridge tax of six cents to the consumer.

All of which is respectfully submitted in behalf of the corporation by the undersigned.

WM. W. WHEILDON.

Rear-Admirals S. H. STRINGHAM and
C. H. BELL, and Bvt. Brig. Gen. J. H. SIMPSON,
Commissioners, &c.

SUPERINTENDENT'S OFFICE, FITCHBURG RAILROAD,
Boston, September 18, 1868.

DEAR SIR: I find, on inquiry, that this railroad has received and discharged the following cargoes year ending December 1, 1867, at the different wharves west of Warren street draw-bridge in Charlestown and Boston, viz:

	Cargoes.
Coal purchased for the use of this railroad company	24
Coal received as freight	180
Lumber received as freight and for railroad company	157
Lime received as freight	62
Salt	19
Plaster, pig-iron, brick, sand, stone, &c	70
Total	512

Which I think is at least ten per cent. less than the present year.

Respectfully,

C. L. HEYWOOD,
Superintendent.

Mr. W. W. WHEILDON.

TRANSPORTATION OFFICE, FITCHBURG RAILROAD,
Charlestown, Massachusetts, September 30, 1868.

Ice transportation over Fitchburg railroad—	Tons.
From December 1, 1863, to December 1, 1864	124,763
From December 1, 1864, to December 1, 1865	157,549
From December 1, 1865, to December 1, 1866	127,263
From December 1, 1866, to December 1, 1867	122,785

J. B. SAVIL,
Master Transportation.

K.

Boston and Maine railroad corporation.—Submitted by W. W. Wheildon.

PRESIDENT'S OFFICE, BOSTON AND MAINE RAILROAD,
Haymarket Square, Boston, September 16, 1868.

DEAR SIR: I have made inquiries of Mr. Perkins, our fuel agent, and he informs me that in the year 1867 we had 23 cargoes of coal for our own use, which came up through the bridges, containing 10,442 tons of

coal. During the same year we had 34 cargoes of ties for the track of the road, containing 54,793 ties. During the present year we have had come up through the bridges, for our own use, 26 cargoes, and shall have 3 more of coal, containing 10,158 tons; also 31 cargoes of ties, containing 60,144 ties. This makes an average of 60 vessels each year, or more, which come up through the bridges, containing materials for the use of our own corporation. The draws are 30 feet wide.

From the freight agent I learn that there were received at the railroad wharf, to be forwarded over the railroad for parties other than the Boston and Maine railroad, as follows, viz: 134 cargoes of coal; 8 cargoes of pig-iron; 5 cargoes of lumber; 10 cargoes of lime; 7 cargoes of grain; 1 cargo of flax—total, 165 cargoes received at the Boston and Maine railroad wharf or bridge, which is above the Fitchburg railroad, between June 1, 1867, and June 1, 1868. This business increases from year to year, as the population and business along the line of our road is on the increase.

Very respectfully, yours,

F. COGSWELL,
President Boston and Maine Railroad.

W. W. WHEILDON, Esq.

P. S.—For the corporation, 61 cargoes; for other parties, 165 cargoes; for one year, 226 cargoes.

BOSTON AND MAINE RAILROAD CORPORATION.

Many of the statements that have been made in regard to the Fitchburg railroad corporation, and its relations to the commerce of Boston harbor, are equally applicable to the business of this corporation. Its freight houses are mostly within the limits of the city, from which all merchandise not intended for shipping is delivered, and where also such merchandise as comes to it by land conveyance is received. But, as is the case with the Fitchburg railroad, its roadway across the river, built on piles, is five rods wide; and this, besides the large wharves of the corporation, is allowed by the legislature to be used for wharf purposes as regards every description of merchandise and material intended to be transported over the company's railroad. With this limitation nearly the whole space at the disposition of these corporations respectively is fully occupied, and means of transportation have to be annually increased to enable the companies to do their large water-borne freight business.

The interior traffic of the Boston and Maine railroad corporation is through an entirely different section of the State from that of the Fitchburg line, reaching, as it does, by its main track and branch roads, portions of the State of New Hampshire. It is, like the Fitchburg and other railroads touching the tide-waters of the harbor, the great wharf-privilege of a country of more than 100 miles in extent, at which all the heavy and bulky water-borne freight, such as coal, lumber, plaster-of-paris, lime, pig-iron, salt, &c., is received. This immense amount of freight, consisting of fuel, building, and other material for the general use of the population, for farming, and more especially for manufacturing purposes, were the navigation of Charles river to be closed, could not be landed, it is believed, on any wharves in Boston harbor within the limits of the city proper, and would be compelled to seek some other port and a more circuitous route to the point of destination, as is the case now with regard to another interest. The wharf property and space in Boston harbor is very limited. The English steamers, it is well known, could not obtain wharf accommodations in the city proper, and for some

time the Glasgow line found accommodations at the Charlestown wharves, and it is very clear that the ample wharf accommodations of Charles river, and those to a large extent yet to be developed on the shores of Mystic river, are absolutely indispensable to the commerce of the district. These would all be rendered less available, and to some extent wholly worthless, by the erection of further obstacles to the free navigation of the two rivers so providentially located, so essential to the harbor, and so necessary to its commerce.

On the line of the Boston and Maine railroad, as upon the lines of all the great railroads terminating in Boston, are located not merely large manufacturing establishments of various kinds, but manufacturing cities and towns, like the city of Lawrence, the towns of Andover, Haverhill, Melrose, and others. With all these the tidewater of Boston harbor is a valuable consideration, and with many of the establishments, with the facilities of navigation and transportation now enjoyed, formed a principal element in determining their location. Any additional obstruction in Boston harbor would be more or less embarrassing and injurious to their business, by increasing the cost of the raw material and transportation to them and giving advantages to rival establishments more favorably located. So that these parties, the recipients and participants in the commerce of Boston, have thereby a direct interest in the preservation of Boston harbor. They have invested large sums of money upon the faith of the government, under whose paramount care the navigable waters of the harbor and the facilities afforded to commerce are presumed to be secure; and hardly a greater wrong could be done to them and the railroad corporations interested than in the attempt to take away from them or abridge the rights and privileges which "every man inherits from nature and cannot justly be forced to purchase," and which they have, in common with others, so long enjoyed.

The Boston and Maine railroad has a capital stock amounting to $4,155,700, and carried, in 1867, over 340,000 tons of merchandise over its road.

Herewith is submitted a brief statement from the President of the Boston and Maine railroad corporation, showing the number of cargoes received at their wharves on Charles river for transportation over their road and for the use of the corporation in their workshops and for the construction and operation of their road. According to this statement there arrived at the wharves of the corporation, above three of the present bridges across the river, during the year ending June 1, 1868, 226 vessels, including 61 cargoes of coal and railroad material for the use of the company, and 165, of which 134 were coal, for transportation over the road.

All of which is respectfully submitted by

WM. W. WHEILDON,
In behalf of the Boston and Maine Railroad Company.

CHARLESTOWN, *September* 29, 1868.

L.

Statement of Boston and Lowell and Nashua and Lowell railroads.

BOSTON & LOWELL AND NASHUA & LOWELL RAILROADS,
Manager's Office, Boston, September 28, 1868.

DEAR SIR: In response to your circular of 21st instant, asking information as to the amount of business, &c., upon Charles river, above the

site of the proposed Maverick bridge, I have to communicate the following items, relating to the property and business of the Boston and Lowell railroad:

Tax valuation upon property outside of location:

In Boston	$680,000
In Cambridge	465,000
Total	1,145,000

Principal freights received by vessel in 1867:

125 cargoes of coal, 37,891 tons.
27 cargoes of lime, 6,500 casks.
14 cargoes of lumber.

166

Respectfully,

GEO. STARK, *Manager.*

WM. W. WHEILDON, Esq.,
Charlestown, Massachusetts.

M.

Owners and occupants of wharves in Charlestown, remonstrants against bridge.

CHARLESTOWN, *August* 28, 1868.

The undersigned, owners and occupants of wharves in the city of Charlestown, hereby protest against the erection of the proposed Maverick bridge across Boston harbor, from Boston proper to the island of East Boston, for the following reasons, viz:

1. That it will be destructive of the commerce and navigation of the district of Boston and Charlestown, by placing a barrier across the central portion of the harbor, obstructing navigation, and promoting the filling up of the channel.

2. That it will contract the wharfage and anchorage of the harbor for merchant vessels more than one-half, (exclusive of the navy yard,) and tend to reduce the commercial city of Boston to a third-class seaport.

3. That as a barrier, shutting in the navy yard from all free access to the sea, it will render that great national establishment comparatively useless, and cause its abandonment at great cost and sacrifice to the government.

4. That it will, for the reasons already stated, greatly impair the value of our wharf property and improvements, by rendering them comparatively useless for commercial purposes.

5. That it will take away from the undersigned the rights and privileges of free access to the ocean, over the great highway open to the whole world, which we and the property we represent have enjoyed for more than 200 years.

6. That said proposed bridge will impose these heavy damages and injuries upon the general government, the Commonwealth, and individuals—absolutely confiscating the property of these parties—without any absolute demand set forth by the legislature of "public convenience and necessity," and without providing for any compensation.

For these and other reasons not herein stated, we object to, and protest against, the erection of the proposed bridge.

WM. W. WHEILDON,
For Sawyer & Hovey's wharf.
GARDNER PROUTY, Agent Dumon wharf.
HENRY LYON.
P. J. STONE.
TIMOTHY T. SAWYER.
MYSTIC RIVER CORPORATION,
By J. E. Bartlett, *President.*
FITCHBURG RAILROAD COMPANY,
By Wm. B. Stearns, *President.*
BOSTON AND MAINE RAILROAD,
By F. Cogswell, *President.*
J. F. & F. L. GILMAN.
EDMANDS & CO.
MASSACHUSETTS GLASS COMPANY,
By Geo. H. Smith, *Superintendent.*
F. M. HOLMES & CO.
S. H. FALL.
FRANKLIN HOPKINS, JR.
S. & G. WILLIAMS.
J. W. BROOKS.
POWERS & EDMANDS.
JAMES GARY.
JACOB HITTINGER.
TUDOR COMPANY,
By C. H. Minot, *Treasurer Tudor Wharves.*
JAMES ADAMS.
GEO. B. PARKS.
AMOS STONE.
JAMES DANA.
CHESTER GUILD & SONS.
NATHAN TUFTS, JR.
FRED'K J. WILLIAMS.
OAKMAN & ELDRIDGE.

N.

Hon. Thomas Russell, collector of port of Boston. Statement of commerce of port of Boston.

CUSTOM-HOUSE, BOSTON,
Collector's Office, August 28, 1868.

DEAR SIR: I enclose the figures you desire, and would refer you for other details to the annual report of the Board of Trade.

The statistics give a very imperfect idea of the coasting trade, as very few vessels in that trade enter or clear. There are no means of ascertaining the number of vessels that arrive at the port, or that leave the port, in a year.

I am glad that you are interested in opposing the mad idea of a bridge across the centre of Boston harbor. If it succeeds, notice should be given that no commerce is wanted at this place. I would also suggest two finger-posts; one pointing toward New York, and one to Portland.

The bridge is, of course, for people to go to and from Boston proper and East Boston, but no one will wish to go either way if we give up our harbor and lose our commerce.

In haste, yours, very truly,

THOMAS RUSSELL.

W. W. WHEILDON, Esq.

	No. of vessels.	Tonnage.
American and foreign vessels entered at Boston for the year ending June 30, 1867	3,028	731,930
American and foreign vessels cleared at Boston for the year ending June 30, 1867	2,977	689,822
Coastwise—entered at Boston for the year ending June 30, 1867	1,378	956,133
Coastwise—cleared at Boston for year ending June 30, 1867	2,151	1,243,366
Exports for the year ending June 30, 1867		$19,317,841
American and foreign vessels entered for the year ending June 30, 1868	2,679	639,605
American and foreign vessels cleared for the year ending June 30, 1868	2,654	595,028
Coastwise—entered	1,317	941,802
Coastwise—cleared	2,318	1,230,852
Exports for the year ending June 30, 1868		$17,378,224

BOSTON CUSTOM-HOUSE.

A correct extract from the records of this office.

THOMAS RUSSELL, *Collector.*

O.

Remonstrance of Mr. Joseph E. Bartlett, President of the Mystic River Corporation.

CHARLESTOWN, *September* 29, 1868.

At a meeting of the directors of the Mystic River Corporation, held this day, it was voted—

That the president of this corporation be authorized and instructed to appear before the commission now in session at the Charlestown navy yard, to examine the question of the proposed Maverick bridge across Boston harbor, and to furnish such facts and information within his knowledge as will tend to aid said commission in their investigation.

AMOS STONE, *Secretary.*

Before Rear-Admirals S. H. Stringham and Charles H. Bell, and Brevet Brigadier General J. H. Simpson, commissioners appointed by authority of the "joint resolution" of Congress "in relation to the erection of a bridge in Boston harbor, whose duty it shall be to make careful

examination of the harbor of Boston, and shall report to Congress, at its next session, in what manner the commerce of said harbor and the interests of the United States in the navy yard at Charlestown will be affected by the construction of a bridge over the water between the main land in the city of Boston and East Boston, in the manner provided in an act of the legislature of the State of Massachusetts, entitled 'An act to incorporate the Maverick Bridge Company.'"

I, Joseph E. Bartlett, of Boston, in the county of Suffolk and Commonwealth of Massachusetts, president of the Mystic River Corporation, and for 15 years last past engaged in furnishing wharf facilities for commerce in the harbor of Boston, being well acquainted with the topography and capacity of said harbor, and having carefully considered the subject-matter now being investigated by said commission, under oath depose and say:

1. Said Maverick bridge, if built as allowed by said act of incorporation, would cut off not less than three-fourths of all the wharves on deep water in Boston harbor, together with the United States navy yard, which are now open to free and unobstructed communication with the sea.

2. In my opinion the construction of said bridge involves the *disuse* of said wharves, and that portion of the harbor thus cut off, by first-class vessels, *for the reason* that shipmasters and ship-owners decline to take such vessels through a drawbridge.

3. The construction of said bridge involves the probable closure of that portion of the harbor in the winter months by *ice*, *for the reason* that any obstruction in that narrower part of the harbor would hinder the escape of the ice which forms in the wider expanses of the harbor above. No winter passes during some portion of which the harbor above the bridges is not closed by ice. Last winter it was sealed up by ice *above* Chelsea bridge for three continuous months. But no day has occurred for 10 years that vessels could not enter or leave the upper part of the harbor *below* the bridges.

4. The construction of said bridge, in my opinion, involves an additional annual expense to such vessels as would continue to pass the same of not less in the aggregate than $300,000, which is the simple interest of $5,000,000.

5. The interruption to travel over said bridge incident to the passage of vessels through the draw would render the same nearly useless as an avenue, *for the reason* that it appeared in evidence before the "committee on harbors" of the Massachusetts legislature last winter that the number of vessels passing above that point in the harbor allowed by said act to be bridged was not less than 16,500 for the year 1867, and supposing an equal number to pass out, the draw would be required to be opened 33,000 times during the year. This number would give an average of 105 vessels for every secular day in the year. Vessels, however, do not arrive and depart thus regularly every day, but they often come and go in fleets of 200 or 300 in a day. General experience and special observation lead me to the belief that the least probable average time of detention to travel caused by the passage of each vessel through the draw would not be less than 12 minutes.

And thus is furnished the problem, $105 \times 12 = 1260 \div 60 = 21$ hours out of every 24 of every secular day in the year that travel would be detained. Or, if it is claimed that the double opening of the proposed draw would double the facilities for passing vessels, then, at least, one-half the above-named number of hours, or $10\frac{1}{2}$ out of every 24 hours' travel, would be detained. This result would inevitably involve a con-

flict between the convenience of travel and the rights of navigation. One of the two interests would be obliged to yield and give way. In this dilemma, $1,500,000 having been invested in the interest and for the benefit of travel, it is feared that the rights of navigation would be most likely to suffer. It is not *practically* true in respect of existing draw-bridges, that the rights of navigation have priority of the rights of travel. That depends largely upon the caprices of those who have charge of the draws. If a vessel arrives at the draw and, the wind and tide being unfavorable, the draw tender has doubts of its rapid and safe passage through, he declines to open the draw until the tide turns.

I have observed a schooner attempt to pass through the Charles River Bridge draw against the wind and tide, assisted by a tug-boat, and after detaining the travel over the bridge more than a third of an hour, to be obliged to abandon the effort.

I have observed the length of time travel was detained by the passage of the following described vessels through the draw in Chelsea bridge over the main channel in Mystic river, viz:

	Min.
July 6, 1868—1. Schooner, with tug	22
July 6, 1868—2. Schooner, with tug	10
July 13, 1868—3. Schooner, with tug	13
July 31, 1868—4. Schooner, with tug	9
Aug. 31, 1868—5. Bark, with tug	10
Sept. 1, 1868—6. Bark, with tug	10
Whole number	6) 74
	12⅓

Average time of the six vessels 12 minutes and 20 seconds.

The above-described vessels were of moderate size, and the wind and tide in four instances were favorable, and in the other two not unfavorable. The above is a pivot draw, and opens a passage way 47 feet wide.

6. The island of East Boston has a population of 20,000,* more especially identified with the mechanical than with the commercial interest, and a valuation of $11,000,000.† The cities and towns upon the harbor and the navigable rivers above the point it is proposed to bridge—not to mention one-half of Boston proper—have a population exceeding 100,000, and a valuation of more than $100,000,000. This shows in some measure how insignificant is the interest which presumes to obstruct the free navigation of the harbor when compared with the commercial interests of the other cities and town in the immediate vicinity, and of the hundreds of thousands of people with their hundreds of millions of valuation in the interior of the country, whose interests are directly affected through the various railroads which reach tide-water on that side of the harbor.

7. Since this investigation by this commission began, it has been suggested by the counsel in favor of the proposed bridge, that the whole question as to its location, management, &c., was to be under the control and guardianship of the mayor and aldermen of the city of Boston. This suggestion has been many times repeated, and with an emphasis which seemed to indicate, that to the mind of the speaker this guardianship was a power not only *final*, but unimpeachable, and infallible!

Who constituted the mayor and aldermen of the city of Boston the

* 20,572, November, 1865.
† $11,246,200 for 1868.

exclusive guardians of the "port of Boston and Charlestown"? Or, why should that body be invested with that title, or with that power?

In answer to the last question, I would simply state, that I have never discovered any indication on the part of the mayor and aldermen of the city of Boston of a desire to protect or develop the commercial interests of the neighboring municipalities.

JOSEPH E. BARTLETT.

BOSTON, *September* 30, 1868.

COMMONWEALTH OF MASSACHUSETTS, *Suffolk, ss:*

Then personally appeared the above-named Joseph E. Bartlett, and made oath that the foregoing facts by him subscribed to are true, and that the opinions expressed are according to the best of his knowledge and belief.

Before me,

W. A. HERRICK, *Justice of the Peace.*

To Rear-Admirals S. H. Stringham and Chas. H. Bell, and Brevet Brigadier General J. H. Simpson, commissioners on the subject of the Maverick bridge, &c.:

GENTLEMEN: Allow me to call your attention to the characteristics of the shores which are to be the termini of the proposed bridge. It will be seen that they are little if any above the line of extreme high water. Hence any kind of suspension bridge—whether partial like that submitted with the plan of T. Willis Pratt, or one on a grander scale which would be of sufficient elevation for vessels of every class to pass under—is *impracticable.*

It was stated by the counsel for the bridge company that they expected, in addition to the ordinary travel, heavy teams and loaded steam freight cars to pass over in connection with the proposed "marginal freight railroad." Now it is well known that Commercial street has been selected by the last-named railroad company as the only suitable one in which to lay down their tracks on that side of the city. And as this last-named street runs very near the shore—within a few hundred feet—the question has been often asked how it is proposed to elevate or drag up said heavily laden teams, and steam freight cars, over so steep a grade as would be required in so short a distance, as that between Commercial street and the water, in order to get onto the bridge suspended 30 feet above high-water mark?

It is evident that any bridge in this location with any considerable *elevation* above high water and the adjacent shores would *not* answer the purpose for which the Maverick bridge is ostensibly sought. And if any countenance should be given to a bridge of any kind across the harbor, it would only result in a flat structure near the water, of the ordinary pattern, and with the usual appliances of those already existing in the neighborhood.

Most respectfully,

JOSEPH E. BARTLETT.

BOSTON, *October* 2, 1868.

GENTLEMEN: I, William F. Veazie, a resident of Boston, near the draw on Warren bridge, observed the length of time travel was detained by

the passage of the following list of vessels through the said draw of Warren bridge, viz:

	Minutes.	Seconds.		Minutes.	Seconds.
No. 1	20		No. 13	10	
No. 2	11		No. 14	9	30
No. 3	7		No. 15	8	
No. 4	5		No. 16	8	
No. 5	4		No. 17 (steam)	6	
No. 6	5		No. 18 (tug-boat)	2	30
No. 7	5	30	No. 19	5	
No. 8	6	30	No. 20	13	
No. 9	5			20)158	30
No. 10	9	30			
No. 11	10	30		7–55	
No. 12	7	30			

Charlestown draw-bridge.

	Minutes.	Seconds.		Minutes.	Seconds.
No. 1	8		No. 6	3	30
No. 2	8			6)47	
No. 3	5				
No. 4	4	30		7–50	
No. 5	18				

WILLIAM F. VEAZIE.

Rear-Admirals S. H. STRINGHAM and CHARLES H. BELL,
and Brevet Brig. Gen. J. H. SIMPSON,
Commissioners in session at the Charlestown navy yard to investigate the effect of a bridge across Boston harbor upon the commerce of said port.

BOSTON, *October* 2, 1868.

GENTLEMEN: Yesterday, at 10 o'clock in the forenoon, there were a dozen vessels lying in Charles river below Charles River bridge waiting for a chance to get through the draw of said bridge. At 12 o'clock, noon, the number had increased to two dozen, and at 4 o'clock in the afternoon there were between 40 and 50 vessels waiting their turn to get through the said draw. Soon after, when the tide had ebbed to within an hour of the time of low water, a tug-boat attempted to take a schooner through the draw, but found it impossible to do so. Finally a second tug came to the assistance of the first, and by pushing at the stern, after the detention of travel 17 minutes, the two tugs got the said schooner through.

A portion of this little fleet of vessels, that were waiting their turn 24 hours ago to get through the draw, were waiting still for an opportunity to pass through this morning when I came over the bridge.

Most respectfully,

J. E. BARTLETT.

Rear-Admirals S. H. STRINGHAM and CHARLES H. BELL,
and Brevet Brig. Gen. J. H. SIMPSON,
Commissioners to investigate the question of the "effect on commerce, &c.," of the proposed Maverick bridge across Boston harbor.

P.

Merchants and wharf-owners in Boston and Charlestown.

To the honorable commission appointed under a joint resolution of Congress in relation to the erection of a bridge in Boston harbor, now sitting at the navy yard in Charlestown:

I have the honor to appear here in behalf of certain merchants and wharf-owners of Boston and Charlestown who protest against the erection of the proposed Maverick bridge. These parties oppose the erection *of any bridge or piers whatever* between Boston and East Boston. The reasons for such opposition, so far as they are of a scientific or technical character—the general reasons—such as relate to the deposits in the harbor; the obstructions to freedom of movement in and out of it, and the precise nature of such obstructions; the delays and perils that a bridge would occasion to navigation in general, have been or will be exhaustively gone into by other parties. After the statement of Major General Foster, of the railroad companies, and of Mr. Bartlett, which are already put in, and of Mr. Boschke, Mr. Francis, Mr. Herschel, and others, which will soon be laid before the commission, there is nothing further to say, by way of detail or explanation, upon the points touched by them. I shall put in one or two remonstrances somewhat numerously signed by merchants and wharf-owners of Boston and Charlestown, and some brief statements of the statistics relating to the business of a few of the principal merchants and mercantile firms who would be injured by any bridge over Boston harbor; one of these firms being the largest shipowners in America. It has seemed to us best, upon consideration, to withhold a great mass of merely cumulative evidence, which would only take up the time of the commission without adding materially to the strength of our representations. I desire to say, however, that no case, so far as I can learn, has yet been brought up where a permanent structure, such as is now proposed, has been thrown across the deepest waters of a seaport. Important navigable rivers have been bridged in cases of great urgency, as the Hudson at Albany and the upper Mississippi, but at points which are ice-bound for several months in the year, or where the summer draught of water is very moderate, and at places where the current always runs one way. Upon navigable rivers in Europe permanent bridges are, I believe, the exception and pontoon bridges are the rule. At Calcutta, after many months' discussion upon a proposal to bridge the Hooghly at a point above the line traversed by all large vessels, consent had only been given at last by the government of Bengal to a pontoon bridge, and that, too, notwithstanding the formidable nature of the *bores*, which, like moving walls of water, rush up that river in the spring.

And yet, here in Boston, it is proposed to fix a permanent draw-bridge across the best part of the harbor, so as to enclose within it three-quarters of all our deep water wharves.

I do not propose to enlarge upon the statistics given in the statements which will presently and hereafter be submitted on our part. They carry their own argument and nothing can add to their significance. They come from merchants and mercantile companies among whom several have individually paid many millions of dollars to the government in duties upon goods imported at this harbor. One of them, the Tudor Company, has at this moment upon the water on their way to this port seven vessels whose cargoes will pay duties of $400,000 in gold, or over half a million dollars in currency.

The remonstrances of such men are weighty and impressive; I shall not expatiate upon them. They are brief, simple, compact, like that observation of a distinguished member of this board the other day—a conversational remark, off hand, uttered merely by way of suggesting a possible difficulty, when we were all looking at the Pratt plan exhibited by Judge Wright: "Suppose," said he, "a vessel lying above parted her chain, this bridge would have to go! I had that occur to me once in the largest ship you have in your harbor, the Ohio; we were lying off Long wharf and she parted her cable and came up to East Boston, and passed by pretty fast; if there had been a bridge there—good bye bridge!"

I desire simply to call the attention of the commission somewhat closely to the provisions of the charter of the Maverick Bridge Company, since that charter, being the same act of the legislature of Massachusetts named in the congressional resolve under which the commission is now acting, contains the only proposition for a bridge which is laid before the board.

The commission will notice that the resolve calls for a report by them upon "the manner in which the commerce of the harbor and the interests of the United States in the navy yard at Charlestown will be affected by the construction of a bridge over the harbor;" but that is not all; the resolve goes on thus: "In the manner provided in an act of the legislature of Massachusetts, entitled an 'Act to incorporate the Maverick Bridge Company.'" It is this last clause to which I would call attention. It makes it the duty of the board to consider carefully in what manner it is that the act referred to undertakes to authorize the construction of a bridge over Boston harbor.

Are the interests of the commerce of this harbor and of the general government in the navy yard sufficiently protected in that act? Let us look at it and see. If they are not, then the commission must needs report against the bridge company, since they come in here and say to you, "we have no plan and no location; we refer you to our charter, viz., the act named in the resolve under which you are sitting; whatever that authorizes or permits to be done, we claim the right to do; the charter refers to the 'single draw plan of T. Willis Pratt,' and we exhibit that plan, but do not hold ourselves bound by it any further than the act itself binds us; it is not our plan, we have none; we offer it simply in explanation of our charter, which refers to it, and as giving some idea of the sort of thing, in a very general way, which is contemplated."

Very well; let us look at their charter. Is it, then, such an act as the general government may safely endorse, and so abdicate its present control over the matter and turn over the harbor and all interested in it to the care of the parties contemplated in that act?

And here let me remark, by the way, that something has been said in behalf of the bridge, at these hearings, about the "natural guardians" of the harbor; the mayor and aldermen of Boston and the State harbor commissioners are pronounced by the counsel of the bridge company to be the "natural guardians" of Boston harbor.

Why, the harbor commissioners are a board (an excellent one, it is true, and worthy of a long life) which is but just created; it came into existence only two years ago, in 1866. Who were the natural guardians of the harbor before that, and who will be if the harbor commissioners should no longer exist? The mayor and aldermen of Boston, perhaps.

Is the city of Boston, then, the only party interested in this harbor? May that city safely be intrusted with the care of all the other towns concerned in its welfare? Who shall look out for the commercial interests of Charlestown and Chelsea and Cambridge—to say nothing of the long tier of inland towns and cities that lie along the three or four railroads

whose wharves are situated above the proposed bridge, and, as it has been so clearly pointed out, are in themselves a harbor, as it were, and storehouse for them all?

New Orleans, on such theory, is the "natural guardian" of the mouths of the Mississippi river. What kind of care did she exercise in that region in 1861 and 1862? About that time another "guardian" had to step in, if I remember rightly—the same powerful guardian, to wit, which protects the interests in that river, not alone of New Orleans, but of Memphis and St. Louis as well, and of the whole vast and wide stretching chain of inland ports which line the course of that enormous stream and its tributaries.

We submit that the United States government, and that alone, is the "natural guardian" of Boston harbor and all other harbors in the country.

To return to my point—the commission have forcibly and repeatedly said that they cannot tell how commerce and the interests of the United States at the navy yard will be affected by a bridge until they know what sort of bridge is proposed.

What sort of bridge then is proposed in this act incorporating the Maverick Bridge Company? For there is no other proposal before you than that which is made in the act; none whatever.

And now observe, we pray you, how loose and indeterminate—purposely so, no doubt—that statute is.

1. It proposes a bridge whose location is wholly undetermined. It is to be "between the main land in the city of Boston and East Boston," (sec. 1;) but there is not a syllable beyond that which tends to fix the location; not a syllable.

2. Three points, viz: first, the position of the piers relative to currents and channels; second, the closeness with which the draw must approximate to a right angle with the channel; and third, the amount of accommodation to be furnished by the draw for the passage of vessels; are required to be determined by the mayor and aldermen on consultation with the harbor commissioners.

But the mayor and aldermen are not required to follow the advice of the harbor commissioners, nor are the commissioners given any authority whatever. It has been asserted here that the harbor commissioners had authority over these points, jointly with the mayor and aldermen, but it is not so. The "direction and approval" (sec. 4) are to come from the mayor and aldermen; "advice" only is the province of the harbor commissioners—which may or may not be followed.

3. As to the location and all other points, the harbor commissioners have not even any right to advise. So far as these points are submitted to anybody but the bridge company, it is to the mayor and aldermen alone, and nothing is said of the harbor commissioners at all, (sec. 4.)

4. It has been stated here that the bridge must conform substantially to the plan of T. Willis Pratt, but that is not so. The act (sec. 4) requires only conformity to Mr. Pratt's plan "*or* such improvements as may be made therein."

But what improvements? By whom made? Who is to judge of them? Not even the mayor and aldermen, as it would seem, can step in here. The bridge company may differ quite materially from merchants and navigators as to what are "improvements" and what are not. Suppose the company should "improve" the plan by lowering the platform 20 feet or more, by increasing the number of piers or by diminishing the width of the draw, who shall say them nay? If the bridge conforms substantially to "such improvements as may be made" in Mr. Pratt's plan, it is within the act.

5. It has been said here that the company is required to keep a steam tug-boat to assist vessels through the draw, but that is not so. It is required only (sec. 4) to keep such a boat "*or* such other aids to the passage of vessels as the said mayor and aldermen shall from time to time direct."

When this act was before the legislature it was proposed, as I am informed, to amend this clause so as to make it read, "*and* such aids," &c., but the friends of the measure voted the proposition down. Are we not to infer then that if the mayor and aldermen required "other aids to the passage of vessels," the company will be exempt from the obligation to supply a steam tug, and that both cannot be required at the same time?

6. But only one steam tug can be required in any case, (sec. 4.) Why did not the act read, "suitable and sufficient steam tug-boats," (in the plural?) As it is, it reads, "*a* suitable steam tug-boat."

How much, we should like to know, would one such boat do towards accommodating the commerce that would pass through the draws of such a bridge? And if, as has been said here in behalf of the company, the tug-boat would generously pull the vessels of merchants not only through the draw but clean up to their wharves, and so save them much time, what in the world would become of such other vessels as might happen to be obliged to wait for the return of this courteous knight errant of a tug-boat from its travels?

7. In view of the control over the matter of building the bridge which is intrusted by this act to the mayor and aldermen of Boston, a great and capital objection to the bridge is found in the provisions of sections 8, 9, and 10, which authorize the city of Boston to take the franchise granted by the act and build the bridge itself, or to take the bridge after it is built out of the company's hands.

Supposing the city should thus take the whole thing into its own possession, we should then behold "this natural guardian" of the harbor, whose oversight, as provided for in the act, is boasted to be so safe a check upon the company, in the very shoes of the company itself, and affected by all the selfsame interests. Who then shall watch the city? *Quis custodiet custodes?* Who shall guard the guardian?

Is it consistent with the interests of commerce and the interests of the government in the navy yard to permit the city of Boston to build just such a bridge to East Boston as it chooses, at any time within five years, and to build it just where it chooses, so long as it conforms substantially to such "improvements" as the city itself may choose to make in Mr. Pratt's plan?

Mr. Pratt in his statement has said that he thinks the bridge would probably result in an increase of wharf facilities on the East Boston side—easterly of the People's Ferry. Such an increase would be wholly in Boston, and the city for the sake of such an advantage might be willing to sacrifice something northerly of the bridge. By putting the bridge up as far as Constitution wharf on thereabout, it might reduce the sacrifice to a minimum. Supposing such a city government as it might be quite possible to elect in Boston should adopt some view like this, it might then seem, so far as Boston was concerned, no very bad plan to put up there some inexpensive structure—a pile bridge perhaps—easy of access and easy to take care of, which would be substantially in accordance with "improvements" that might be made upon Mr. Pratt's plan—a bridge which would be acceptable, moreover, to a short-sighted majority, able for the time to control the government of the city. The interests of Boston, I say, might perhaps not seem to suffer very much

by such an arrangement; but what shall be said of the interests of the United States in the navy yard and of the commercial interests of Charlestown, Chelsea, and Cambridge?

I have considered what sort of things the act to incorporate the Maverick Bridge Company will allow and justify. We shall be told, perhaps, that it is not to be supposed that the bridge company or the city would vary much from Mr. Pratt's plan as it had been put in here. But how do you know they will not? The act permits it, and it is fair to suppose that the company in the main will consult its own interests. Does the bridge company ask for a roving commission to build pretty much anywhere it likes up and down the harbor, and then desire to be trusted for good intentions? The United States, we apprehend, will deal with such a party as one intelligent business man deals with another—on business principles. It will ask for guarantees and for something definite before it commits itself. Nor is the inquiry I have suggested a mere search after technicalities.

We submit to the commission that the objections here raised are broad, substantial, and well founded, and as such we commend them to the attention of this honorable board.

JAMES B. THAYER,
For Merchants and Wharf Owners in Boston and Charlestown.

BOSTON, *September* 30, 1868.

Q.

Remonstrance of merchants and ship-owners of Boston.

The undersigned, merchants and ship-owners of Boston, engaged in foreign commerce, producing large revenues to government, protest against the erection of bridges, piers, or structures of any kind between Boston and East Boston, as the same could not but tend to destroy said commerce and revenue; the ships required by said commerce being of the largest class, great depth, and the harbor facilities at present being altogether too contracted for safe navigation.

W. Ropes & Co.
John L. Gardner.
Bayley, Rollins & Co.
William Perkins.
N. H. Emmons.
Andrew T. Hall.
Gossler & Co.
F. Nickerson & Co.
Glidden & Williams.
B. Goddard.
J. G. Kidder.
Israel G. Whitney & Co.
Wm. F. Weld & Co.
Tudor Co., by C. H. Minot, treasurer.
J. Ingersol Bowditch.
Alpheus Hardy.
Wm. H. Bordman.
William Parsons.
Curtis & Peabody.
E. Atkins & Co.
Baker & Morrill.
N. Mackay.
Wm. P. & Geo. Draper.
Nath'l Goddard.
Thayer & Lincoln.
Iasigi, Goddard & Co.
C. O. Whitmore & Sons.
P. S. Shelton & Co.
Benj. Burgess & Sons.

BOSTON, *September* 30, 1868.

R.

Remonstrance of the Tudor Company.

To the honorable the United States commissioners on the subject of a bridge between Boston and East Boston:

The Tudor Company respectfully represent that as wharf owners at Charlestown and as merchants engaged in foreign commerce (and the source of large revenue to the government) they protest against the erection of any piers or structures between said Boston and East Boston, as the effect could not but be destructive to said commerce and injurious to themselves.

At Charlestown they possess two large wharves with extensive bonded warehouses and others in the course of construction, and from said wharves they despatch annually exceeding 60 vessels, mostly of the largest class, of 21 to 22 feet draught of water, for the East India and China ports, and many of said vessels return direct from Asiatic ports to said wharves with valuable cargoes, upon which heavy duties accrue to government. At this time seven vessels are on their return from India and China with cargoes, the duties upon which aggregate $400,000 in gold, or exceeding half a million of dollars in currency as revenue to the government. At Charlestown are loaded annually 350 to 400 vessels with ice, the greater portion in the winter months; and it is only from unobstructed channels that drift ice is prevented from becoming permanent.

The area from Charles river bridge to Chelsea bridge and the line of the proposed structure is 398 acres, and the duration of slack water at this point but 16 minutes. At present, with the assistance of tug-boats, and under the care of pilots, the larger ships despatched by them can only depart from Charlestown at slack water and at full flood.

The number of deep water wharves, beginning with Lewis wharf outside of the proposed bridge, in Boston proper is eight; and inside, 18 in Boston and 8 in Charlestown; or 26 wharves in all, which would be seriously injured by any structure, and three-fourths of the accommodation for large vessels would be enclosed by the bridge. If the wharves in East Boston are counted the proportion remains the same. The construction of any bridge across the most important part of the harbor cutting off open communication with the sea would occasion the disuse in part of the present wharves and thereby destroy the commerce now directed to them.

With much respect, we are, gentlemen, your obedient servants,

TUDOR CO.,
By C. H. MERIOT, *Treasurer.*

BOSTON, *September* 30, 1868.

LOWELL, MASSACHUSETTS,
October 1, 1868.

DEAR SIR: On my return home to-day I found your letter of the 28th ultimo, asking me to furnish you with a copy of a speech made by me on the Maverick bridge question in the Massachusetts house of representatives on the 5th of June last. It embodied my views in a brief form, as derived from the evidence presented to the committee on harbors, of which I was a member, and to whom the subject was referred.

On the question of reporting the bill the committee were equally

divided, one of the members, who had not attended the hearing, not voting.

Being a matter in which my immediate constituents had no special interests apart from other citizens of the commonwealth, I have given it no attention since, and should therefore be unable to add anything to what I then said that could be of use in the present inquiry.

I send a copy of the paper containing the speech, which please make such use of as you may think proper.

Respectfully yours,

JAMES B. FRANCIS.

W. W. WHEILDEN, Esq.,
Charlestown, Massachusetts.

To the honorable commission appointed under a joint resolution of Congress in relation to the erection of a bridge in Boston harbor; now sitting at the navy yard at Charlestown:

The undersigned, in behalf of merchants and wharf owners of Boston and Charlestown objecting to the erection of said bridge, respectfully submits the subjoined remarks of the Hon. James B. Francis, of Lowell, made in opposition to the bill for the incorporation of the Maverick Bridge Company in the house of representatives of Massachusetts on June 5, 1868, and printed in the Boston Daily Advertiser of June 6, 1868. The distinguished ability and reputation of Mr. Francis as a civil engineer entitle his views to the most respectful consideration; especially in view of the fact that they were delivered after a full hearing of the evidence presented both by the friends and opponents of the Bridge company before the house committee on harbors, of which Mr. Francis was a member.

J. B. THAYER,
For the Tudor Company and others.

BOSTON, *September* 30, 1868.

Remarks of Mr. Francis of Lowell against the bill to incorporate the Maverick Bridge Company.

Mr. FRANCIS, of Lowell. This matter was referred early in the session to the committee on harbors, of which I am a member. The committee heard the petitioners and parties opposed to the bridge at great length, but were unable to agree on a report. I do not propose to discuss the necessity for the bridge, although I must admit that the want of some better means of communication between Boston proper and East Boston is very great; but I think it should be looked for by improving the ferries, which might easily be made to afford as good or even better accommodation than that between Brooklyn and New York. It is claimed that it cannot be done on account of the greater rise and fall of the tide in Boston harbor; but that this can be easily overcome is plain from what is done at Liverpool where the rise and fall is perhaps twice as great as here.

The great objections to the bridge are its interference with commerce and the navy yard. A very large part of the vessels entering Boston harbor go above the ferries, near which the bridge is proposed to be built. It appeared that last year about 16,500 vessels passed the drawbridges above the proposed site for the bridge, and that about as many more stopped at the various wharves between the proposed site and the drawbridges, making about 33,000 vessels which passed the proposed site last year, say 100 per day on an average. All the vessels to the Lowell, Boston and Maine and Fitchburg railroads; all the great ice ships for India, now 50 to 60 a year, and drawing more than 20 feet of water; all the ships of war, and in fact nearly all the largest ships entering Boston harbor, go above the site of the proposed bridge; and if the bridge is built all that go there must pass its drawbridge, and at particular times of tide. Much evidence was given as to the extreme sensitiveness of the owners of large vessels and their unwillingness to allow them to go where they might be in-

jured, and also as to the difficulty of handling them in confined places like drawbridges, particularly when exposed to currents and winds, and also that if the bridge was built, very few large ships would go above it. All this was denied by the petitioners and attempted to be disproved by pilots and others, but the weight of evidence to my mind was that the bridge would be a great obstruction to the movement of the largest class of vessels, and diminish to a great extent the number frequenting that part of the harbor.

An average of 100 vessels a day passing the draw will be a serious interruption to the travel over the bridge. From the experience at Providence, Albany and Chicago, the petitioners attempted to show that by the use of steam power the time required for the opening and shutting of the draw and the passage of a vessel would not exceed three minutes; I do not think they make sufficient allowance for the prodigous size of the proposed draw, which is 400 feet long and 75 feet wide; more than twice the length of this State-house, and a quarter part wider than this hall; it will cover nearly three-quarters of an acre, and its weight cannot be less than 1,000 tons, and probably nearer 2 000. This enormous mass cannot be started or stopped suddenly. Then again, time must be given to clear the bridge of teams and passengers before the opening is commenced; this will require at least two minutes. So that if we take the time required for opening and shutting, and passing a vessel, at three minutes, as the petitioners claim, which I think is much less than it will average, we shall have five minutes' interruption to the travel at the passage of each vessel, making an average of 500 minutes per day, or eight hours and 20 minutes, that the travel will be interrupted. It will be said that frequently more than one vessel will pass at a time; it appeared, from evidence introduced by the petitioners, that at Chicago at one-sixth of the number of openings more than one vessel passed. Evidently not much time can be saved in this way except by a serious interference with the free movement of vessels. With the present amount of commerce the travel will be interrupted on *an average* eight hours per day; but vessels come into and go out of the harbor in fleets depending on the direction of the wind, and frequently for more than half the time the travel over the bridge will be interrupted. At Chicago the average number of vessels passing one of the draws is about 100 per day, but on some days it is more than 200, and one day in 1866 it was stated that 321 vessels passed. The interruption to the travel there is so great that they are attempting to build tunnels under the river to avoid it. There they have several bridges, here the whole travel will be concentrated on one bridge, and the interruption must be far greater. Clearly, one of two things must be the result if this bridge is built; either the interruption to travel over the bridge will be very great, or there will be great interference to the free movement of vessels, and consequent injury to commerce. Both interests will probably suffer to a serious extent, but commerce I fear will suffer the most.

The effect of the bridge on the navy yard, at which there were 383 arrivals and departures last year, I consider of the highest importance, and a sufficient reason for not granting a charter to build it. The navy yard I consider the chief protection to Boston from a foreign enemy. Forts now-a-days seem to be of little account—iron-clads must meet iron-clads, and where will they be stationed except at navy yards? Then again, the government, if they attempt to protect anything by means of forts, will protect their own navy yards, and they cannot protect Charlestown navy yard without at the same time protecting Boston. Do not let us give them any pretext for abandoning it.

On the whole, therefore, Mr. Speaker, it seems to me that the proposed bridge, if built, would not only be a great damage to commerce and interfere seriously with the navy yard, and tend toward its partial disuse if not abandonment, but from the constant use of the draw-bridge would not afford the accomodation to the travelling public that is anticipated, and that it will be a great damage to commerce without any corresponding advantange to the commonwealth.—*Boston Daily Advertiser of June* 6, 1868, (*supplement.*)

S.

Remonstrance of Boston Gas Company.

OFFICE OF THE BOSTON GAS LIGHT COMPANY,
20 *West Street*, *Boston*, *September* 29, 1868.

GENTLEMEN: The interest of the corporation would be affected unfavorably by the construction of any bridge connecting Boston and East Boston.

We are the owners at the present time of five wharves, next northerly to the Charles River bridge.

In the year 1867, our receipts of coal were 56,020 tons, which were brought by 142 vessels; of these vessels 132 brought foreign coal to the amount, say of 51,000 tons, paying to the United States a duty in gold of over $63,000.

The vessels bringing English coal are mostly of large tonnage, drawing 18 to 20 feet water.

Any increased cost of coal falls directly upon the gas consumers of the city, so that any legislation which is injurious to us pecuniarly is of direct concern to the whole city of Boston.

With much respect, I remain, gentlemen, your obedient servant,

W. W. GREENOUGH,
President.

Hon. UNITED STATES COMMISSIONERS,
On subject of proposed bridge between Boston and East Boston.

T.

Remonstrance of Hon. George M. Barnard.

BOSTON, *September* 30, 1868.

GENTLEMEN: Succeeding my father, who had been extensively engaged in commerce, foreign and domestic, since 1800, I have been also very largely concerned in the importation of merchandise into this port, and the business thus carried on during the whole of the present century, without intermission or, except by war, without interruption, has involved a constant deep interest in the preservation of our harbor.

From my earliest recollection, two points have constantly excited the anxiety and attention of all interested in our commerce, the shoaling of the channel and the obstruction by ice. Either of these difficulties, if unchecked by adequate remedies would, in my judgment, be almost fatal to our harbor for the purposes of navigation and commerce.

The tendency to shoaling in the channel I have always understood to be incontestable, and from my own observation and experience, it is with the greatest difficulty that, in a severe winter, the ice is prevented from closing the passage of vessels to and from the wharves for many weeks. The constant traverse of the East Boston steam ferry-boats has greatly prevented the blockade of ice.

The building of a bridge, involving the construction of piers, impeding more or less the flow of the current, will unquestionably induce the deposit of mud and the consequent shoaling of our already scanty channel, and serve to hold back the ice so, as I believe, to render unavailable for navigation during a very large portion of the winter all the wharf accommodation above the bridge. How largely it must impair the value of our harbor to the whole country as the resort or station of a navy, and how largely it would curtail the service and value of that branch of force will be best known to the honorable commissioners. But as a merchant, I believe that the proposed bridge would so embarrass and shackle the operations of commerce and navigation as to rapidly reduce, and eventually destroy, the whole of our foreign trade.

I have the honor to be, with great respect, your obedient servant,

GEORGE M. BARNARD.

Hon. UNITED STATES COMMISSIONERS
On the subject of a bridge between Boston and East Boston, &c.

U.

Protest from all the owners and occupants of wharves between East Boston ferry and Charlestown bridge.

To the honorable commissioners upon the subject of a bridge between the city of Boston and East Boston, now sitting at the navy yard in Charlestown:

The undersigned, proprietors, occupants, or agents for the undermentioned wharves, comprising all the wharves between the East Boston ferry and Charlestown bridge, respectfully remonstrate and protest against the construction of any bridge between the city of Boston and East Boston, for the following reasons:

Any bridge whatever would be a serious and very injurious obstruction to the business and commerce of the city of Boston, and a bridge resting on piers or piles would inevitably prevent the free current of the tide, and have a tendency to lessen the depth of water in the harbor, and narrow the channel of deep water.

Such a bridge would also very much reduce the extent of available anchorage ground for vessels of medium and large draft of water, and if the proposed bridge should be erected at or near either of the ferry-ways to East Boston, the most desirable space for anchorage would be reduced probably one-third, or even more.

Such a bridge would also entirely close the part of the harbor above the bridge for many weeks during the winter, since the ice could not be removed from above the bridge, and in all probability it would be the means of closing the whole upper harbor, even below the bridge for a longer or shorter time in the winter, as it is well known that the ice has in former years, and not unfrequently prevented the approach of vessels to the wharves in the city for several weeks at a time, and has only been prevented doing so in later years by the running of the steam ferry-boats.

The damage and injury to the wharf and warehouse property above the proposed bridge cannot be estimated. All access to these wharves, by ships may in all probability be rendered impossible for at least three or four months, and in hard winters even longer, and outside of the proposed bridge there is not wharf accommodation for the larger class of vessels or store-room for their cargoes.

There would also be great obstruction and delay in the transportation of merchandise over the bridge caused by the frequent opening of the draw for the passage of vessels, and the loss of time occasioned thereby would be from eight to ten hours daily on an average through the year, and on some days, in winter, or when an unusual number of vessels are arriving, the draw may be required to be open nearly one half the time during daylight, and the delays and obstructions to navigation resulting from the crowds of teams and other vehicles, and passengers which will accumulate on the bridge, and the time that will be occupied by closing the draw and clearing the bridge, and again opening the draw cannot fail to be very great and these delays and loss of time, will be a very serious damage and injury to the trade and commerce of Boston.

BOSTON, *September* 30, 1868.

CONSTITUTION WHARF COMPANY, by S. S. Williams, treasurer.
FOSTER & SON, coal.
YOUNG ———, coal. } Isaac Harris, owner.
J. RICH & CO., fish.
GRAY'S WHARF, Otis Durry for J. S. Brandy, proprietor.

BARTLETT'S WHARF, } James L. Mills and Son.
ATKIN'S WHARF, }
CLAPP'S WHARF, Mills Brothers.
LINCOLN'S WHARF, Noah Lincoln.
BARTLETT'S WHARVES, Theodore A. Neal.
UNION WHARF, S. E. Peabody, treasurer.
FISK'S WHARF, S. E. Peabody for George Peabody.
BOSTON GAS-LIGHT COMPANY'S WHARVES, five in number, W. W. Greenough, president.
SARGENT WHARF, } Nathan Matthews.
MOORE'S WHARF, }
WINNESSEMMET Co., by N. Matthews, president.
CLAPP'S WHARF, A. Wilbur & Co., owners.
WIGGIN'S WHARF, A. Wilbur & Co., owners.
ROBY'S WHARF, A. Wilbur & Co., occupants.
BATTERY WHARF, John Révere.
CONROY'S WHARF, D. R. Sortwell, owner.
ASPINWALL'S WHARF, W. H. Grueby, owner.

V.

Remonstrance of Hon. Josiah Quincy, chairman of board of harbor commissioners.

BOSTON, *October* 1, 1868.

SIR: In behalf of the board of harbor commissioners I submit a report of their engineer, detailing some of the physical objections to the construction of a bridge between Boston and East Boston. It is accompanied by a chart showing the depth of water in this part of the harbor, and the only points where ships of the first class can ride at anchor.

I have the honor to be, with sentiments of the highest respect,

JOSIAH QUINCY,
Chairman of Board of Harbor Commissioners.

Admiral STRINGHAM,
President, &c.

BOSTON, *September* 30, 1868.

SIR: In obedience to your instructions to report to you such facts as might demonstrate the extent to which the construction of a bridge between Boston and East Boston would be an obstruction to navigation and cause injury to the channels of the harbor, I have the honor to make the following statement:

A bridge across the navigable waters of any harbor is a serious obstruction to the free navigation of its channels; and in this instance it is most objectionable on account of its location.

Boston proper, South Boston, East Boston, and Charlestown can be considered most favorably situated for commercial purposes, each being a peninsular offering the widest range of water front upon the navigable waters of the harbor. So far nineteen bridges intercept navigation to the full water front of Boston harbor. Much could be said about the want of forethought in placing this embargo upon the free navigation

of the harbor, and the abuse of power granted to corporations to build these bridges in the most primitive form, offering the greatest possible difficulty to the passage of vessels and obstructing the tidal flow of the water. In the present instance more caution has, apparently, been exercised, and conditions are impossible upon the Maverick Bridge corporation to obviate the errors of previous grants. Nevertheless, I consider in this case the *location* of the bridge as one of the greatest objections.

Of all the water front in this harbor there remains for commercial purposes only 120,000 lineal feet of wharfage unobstructed by bridges; and this the contemplated bridge would, if located somewhere on a line between Battery or Constitution wharves and Maverick wharf, reduce to 64,200 lineal feet of wharfage, against which vessels may lie to load and discharge freight. It might further be claimed that about one-half of the portion so cut off is now used by a class of large vessels which would probably abandon those wharves in preference to passing a bridge even if it was built in the manner prescribed by the act.

Setting aside the errors of the past, by which 43,000 lineal feet of wharfage front were cut off by the obstruction of bridges, and can now only be used for coasting vessels, although the depth of the channels would have permitted vessels of the largest class to use a large portion of that water front, it is now further contemplated to cut the remainder of the present water front effectually in two. I believe there is no instance to be found where a mercantile community has committed an act so suicidal to their commercial interests.

The location of the bridge on a line as above assumed, or between the landings of the ferry at present in use, would render it necessary to give up half of the anchorage ground for large vessels to the proper and unobstructed use of the bridge. There is only room to anchor four vessels of the largest size at present in the vicinity of the city, as the accompanying tracing shows.

Every person familiar with the harbor knows that our "coasters" generally arrive in fleets of a dozen or more, bound for the Charles and Mystic rivers, and in the event that one or two large vessels were at anchor above and below the contemplated bridge it would be impracticable to anchor them in the vicinity of the bridge to await their turn to pass the draw without obstructing that portion of the harbor, particularly to vessels leaving or making the wharves in that vicinity. Consequently one or the other class of vessels must give way.

A further difficulty would arise from the location of the bridge to all large vessels leaving the wharves in its vicinity, or leaving Charlestown, and especially the United States navy yard; on account of the direction of the current and existing shoals they would have difficulty, even with the aid of steam, in placing themselves in a position upon the limited area left to them to obtain a proper steerage way to make the draw opening with any degree of certainty; and in case of failure to do so it must result in an injury to the bridge or the vessels, or both, as the current is sufficiently strong to make a collision a serious affair. It is beyond all question that not more than one large vessel could make the attempt, for it is well known that large vessels can leave their berths at or near high water only. Consequently it being impracticable for one vessel to wait for another to make its evolution in order to pass the draw, the construction of the bridge would either reduce the departure of our large vessels from above the bridge to one in number per day, or render it necessary to abandon the use of that portion of the harbor above the bridge for large vessels.

The adoption of a certain plan for the construction of the bridge may

in a great measure prevent any very serious injury to the channels of the harbor and the obstruction of the tidal flow, which could not by the expenditure of money be remedied.

No definite dimensions for the piers of the bridge have been designated, and it is only necessary to mention that, in proportion as they will reduce the water way, a corresponding deepening of the channel in that vicinity will take place until the cross-section has been restored, which may cause a removal of about 25,000 cubic yards of material and its consequent deposit in a valuable part of the channel. An increase of the velocity at the bridge will also be the consequence, probably not exceeding 4-10 mile per hour, however, which is not very desirable in this narrow part of the harbor. It is probable that any ice embargo above or at the bridge might be prevented, provided steam tugs should be properly employed to break the ice and prevent any jam or collecting of ice-fields at the bridge.

I do not know that it is within my province to speak of the doubtful facilities which the bridge would offer as a means of communication between Boston and East Boston; but as I have collected the statistics of the number of vessels passing the line of the contemplated bridge, it appears proper to mention this subject in connection with the disadvantage to both travel over the bridge and delay to shipping.

Recorded and estimated number of passages through the draw per annum, 33,000.

Probable time consumed in the passage of a vessel from the time of closing the gates to travel to the reopening of communication, 7 minutes.

Estimated as follows:

Time allowed persons to leave the draw before turning off, say 300 feet, at four miles per hour	1′
Turning the draw off by steam power	1′ 30″
Draw open for passage of vessels, say 800 feet, at 3 miles per hour, that distance being required, as no draw piers are contemplated.	3′
Turning the draw on	1′ 30″
Total time	7′

Consequently, under the most favorable conditions, using steam for opening the draw, and passing vessels through by steam, a delay of five hours out of 12 would result to all travel and transportation across the bridge. But as it is evident that we cannot distribute the passage of vessels uniformly as to time for their passage, there would be times when either the vessels would be delayed or all transportation across the bridge stopped.

I have not thought it necessary to speak at length of the irreparable injury which the proposed bridge would be to the navy yard at Charlestown.

It needs no argument to show that, if the bridge is built, the navy yard must be either wholly or partially abandoned.

Most respectfully submitted.

A. BOSCHKE,
Engineer to the Harbor Commission.

Hon. JOSIAH QUINCY,
Chairman of Board of Harbor Commissioners.

W.

Protest of Nathan Matthews, president Winnisimmett Ferry Company, against the bridge.

To Rear-Admiral S. H. Stringham and Charles H. Bell, and Brevet Brigadier General J. H. Simpson, commissioners, convened at the navy yard in Charlestown to examine the operation of the proposed Maverick bridge across Boston harbor, &c.:

GENTLEMEN: The undersigned, a resident of Boston, and for 30 years acquainted with its commercial facilities and business, a large wharf-owner in Boston and Chelsea, and for 15 or 20 years last past having been president or manager of the Winnisimmett Ferry Company, whose boats ply between the cities of Boston and Chelsea, begs leave to state:

First. That said ferry boats have been the most efficient agent in developing the commercial and general prosperity of Chelsea, as a large majority of the travel between the two cities is by the ferry.

Second. That said boats have been the most potent agents in keeping the upper portion of the harbor free of ice in the winter season, during the severer portions of which they are obliged to be run all night. But in my opinion should any obstruction be allowed to be placed in the narrow strait below, between the main land in Boston and East Boston, no existing available appliances would be able to prevent said upper portion of the harbor from being closed by ice and for the time being lost to navigation. This would involve the discontinuance of the ferry and inflict a severe blow upon the commercial and business prosperity of the city of Chelsea.

Third, The obstruction to navigation resulting from a drawbridge the year round, in addition to the complete blockade by ice in the winter, would be a serious injury to the north end of Boston, to the navy yard, and to all the cities and towns upon the navigable waters above the line which it is proposed to bridge.

Fourth. In my opinion, there is no exigency which would justify Congress in allowing at any time a bridge to be built across Boston harbor.

Respectfully,

NATHAN MATTHEWS,
President of the Winnisimmett Ferry Co.

BOSTON, *October* 2, 1868.

X.

Protest of treasurer of Constitution Wharf Company, of Boston.

The treasurer of the Constitution Wharf Company submits to the honorable commissioners the following statement:

The number and description of vessels that came to Constitution wharf to discharge or load, in whole or in part, during the term of three years, from September 1, 1865, to August 31, 1868, are as follows:

Fifty-two steamers, of from 1,200 to 2,280 tons; 137 ships, of from 700 to 1,886 tons; 135 barques, of from 700 to 1,886 tons; 26 barques; 26 brigs; 105 schooners; 3 sloops.

All the steamers and very nearly all the ships and barques brought

cargoes from foreign ports, many of them drawing from 20 to 24 feet of water, and requiring very large wharf accommodation to facilitate the landing of their cargoes.

There are convenient berths for five vessels of the largest class to discharge or load at the same time.

For the Constitution Wharf Company,

S. T. WILLIAMS,
Treasurer.

BOSTON, *October* 1, 1868.

Y.

J. F. and F. L. Gilman, September 24, 1868.

CHARLESTOWN, *September* 24, 1868.

GENTLEMEN: We present to you for your consideration, as a small part of the business on Mystic river, No. 49 to 57 Medford street, Charlestown.

Wharf and buildings we value at $30,000. In 1867 we received 20 freights of granite, averaging 120 tons each, delivered by sloops—total 2,400 tons; usual price per ton for freight through each bridge extra, five cents, $12,000.

And an additional bridge would actually cause delay in receiving granite, and in many cases would delay the erection of buildings, and we think would greatly reduce the value of wharf property in this vicinity.

Very respectfully, yours,

J. F. & F. L. GILMAN.

Admirals STRINGHAM, BELL, and Gen. SIMPSON.

Z.

Commodore G. S. Blake, September 18, 1868.

LONGWOOD, NEAR BOSTON,
September 18, 1868.

MY DEAR ADMIRAL: At the request of several citizens of my native place, Boston, who are much interested in the subject which you are here to investigate, I beg to say a few words to you in regard to it, though I can hardly expect to suggest anything which will not readily occur to you.

It happened that when I entered the navy in 1818 I was attached to the Independence, then lying off Long wharf, bearing, as you will perhaps remember, the pennant of Commander Bainbridge. While attached to her, I was detailed as one of the party of Captain Wadsworth, who was engaged in a hydrographical survey of Boston harbor, and was employed with him personally in the soundings. I became, in this way, quite familiar with the harbor half a century since, and whenever I have visited it at later periods, I have been struck with the great changes which have occurred, owing, as it seems to me, to the numerous bridges and wharves which have been built around it in all directions. A brig could hardly swing clear in the old berth of the Independence.

It seems to me that the objections to the proposed bridge are very obvious, and that among them are the following:

First. That it would contract very materially a very important part of the harbor, which is already very much crowded and inconveniently small.

Second. That it would interrupt the free passage of floating ice in winter, and that fields of ice would certainly consolidate above the bridge, and thus interfere with the passage to or from the navy yard as well as a portion of the city wharves.

Third. That it would undoubtedly affect the tidal currents of the harbor very seriously, and occasion deposits which might be very injurious

Fourth. That the statistics of passing vessels will show that the draw would be open nearly if not quite half the time, and that thus the bridge would not materially facilitate the transit between East Boston and the city proper.

I trust that you will pardon the liberty I take in writing you on this subject, which you will so carefully consider in all its bearings, and believe that I do it only at the urgent request of my friends.

Most respectfully and truly yours,

G. S. BLAKE.

Rear-Admiral BELL,
United States Navy.

Z 1.

Commodore John Rodgers, commandant navy yard, Boston, opposing bridge.

UNITED STATES NAVY YARD, BOSTON,
Commandant's Office, October, 1868.

GENTLEMEN: In reply to your letter of the 28th ultimo, I have the honor to state that my views are adverse to the propriety and to the expediency of erecting the Maverick bridge.

It occurs to me as a seaman that the principal harbors, even of a country less extensive than ours, are too useful to the world to be obstructed for merely local purposes.

Into whatever port a ship enters she finds the care taken to facilitate navigation is in proportion to the civilization and intelligence of the nation possessing it. She finds in Boston charts published, pilots licensed, light-houses erected, buoys placed, obstructions carefully marked or removed, fortresses built to preserve peace and insure neutrality.

No nation which has the skill to design Maverick bridge would grant permission to build it.

The immovable property in this navy yard is estimated by the civil engineer of the yard at the value of $30,000,000. This whole property is held for the sole purpose of sending vessels to sea, and the millions annually expended here have no other ultimate end in view.

The government has now the right of free access to the ocean through a channel stretching from shore to shore.

The Maverick Bridge Company ask permission to confine this passage to a draw.

No experienced seaman can aver that, in unfavorable circumstances of wind and tide, the passage of a large and deep vessel through the draw would not be fraught with danger at once to the vessel and to the bridge.

A very small per cent. of risk would with so costly a structure as a single steam frigate amount to a large sum, but the importance of promptly and safely getting a fleet to sea in some national exigency cannot be estimated in coin.

Who can reckon the value of the opportune arrival of a new army corps at Bull's run, for instance, or in such a case estimate the national loss involved in a few hours' detention.

A contingency is possible in which the Maverick bridge might turn the event of a battle.

But for this narrowing the channel, and for the risk of passing the draw, and for the hindrance of our fleets in a national crisis, the Maverick Bridge Company has no equivalent to give, and offers none.

No vessel would choose to beat very near it; no vessel can beat to her anchorage beyond it; no large vessel would choose to anchor within 600 or 700 feet of the bridge, for fear of dragging her anchor in bad weather and swinging against the structure.

It will abstract from the area of the harbor available for the general purposes of commerce, and of the navy, its own width, and a strip of water on each side 600 or 700 feet wide, amounting in all to something like 2,000,000 of square feet.

The injury to an important part of a great commercial port can scarcely fail to injure the whole, as the paralysis of a limb injures the whole man.

This harbor is the principal one in New England, and the interest involved in its conservation extends wherever its commerce reaches.

No local pleas should prevail in so wide a concernment.

But in effect the Maverick bridge, by damaging the property above it, will give an increased value to that below it. It will take away from the United States and from part of its citizens the valuable natural right of unobstructed navigation, whereby the property below the bridge will be benefited.

It may be doubted whether the bridge would do more than change the enter of commerce and money value in the port; it would surely do this, but it is very uncertain whether the draw would not be open too often and too long to leave the bridge useful as a means of transit.

A statement has been made by the harbor master that he has no doubt but that he has seen 200 vessels pass the site of the bridge in a day. Allowing only 10 minutes for swinging the huge draw, near 400 feet in length, and for the passage of each vessel, these would take 2,000 minutes, or over 30 hours. If the draw should not suffice for the navigation it could not at once accommodate navigation and travel. No one in this country would use a route liable to unlimited detentions. But the board of commissioners is aware of the facilities given by the ferries for transit to New York.

There is no reason why ferries should not as amply accommodate East Boston with its comparatively few needs; but in fact East Boston now communicates with Boston by Chelsea bridge. In this she has an advantage of wheel and foot transit to her capital, possessed neither by Brooklyn nor Jersey City.

The ferry companies are indefatigable ice-breakers, their steamers, running day and night, perform involuntarily this necessary service.

The Maverick bridge in its charter makes provision for doing away with one of these ferries; an injurious effect may be forseen upon distribution of the silt. For all these reasons I deem it unwise and unjust to permit the erection of Maverick bridge.

I append statements of the draw-keepers of Chelsea and Warren bridges, and one from the harbor master, also one from the naval con-

structor, showing the height of vessels' masts, the draught of some of them, and the length of some.

These papers tend to show the impolicy of permitting the erection of Maverick bridge.

I am, respectfully, your obedient servant,

JOHN RODGERS, *Commandant.*

To the COMMISSION ON THE BRIDGE.

CHELSEA BRIDGE, CHELSEA—NORTH DRAW,
September 26, 1868.

We, the undersigned, hereby certify that we have carefully examined the records of our office and find that from April to November, both inclusive, 1867, 1,064 vessels passed through this north draw; and from December, 1867, to March, 1868, both inclusive, to the best of our knowledge and belief, about 100 vessels, which we consider a fair average for the past three years.

We also certify that to the best of our observation, knowledge and belief, that from December to March, both inclusive, the navigation above the bridge is obstructed at different periods all of two months, the obstruction immediately below the bridge being prevented by ferry-boats and tugs used for that purpose.

WILLIAM H. ARCHER,
WESLEY ABBOTT,
Toll gatherers and in charge of North Draw.

CHARLESTOWN, SOUTH DRAW CHELSEA BRIDGE,
September 26, 1868.

We, the undersigned, hereby certify that, to the best of our knowledge and belief, an average of 2,500 vessels have passed through the south draw of Chelsea bridge during eight months in the year, for three years past, and 600 from December to March, both inclusive, for the same period.

We also certify, to the best of our observation, knowledge and belief, that from December to March, including both months, the navigation above the bridge is obstructed all of two months, the obstruction below being prevented by ferry-boats and tugs used for that purpose.

DANIEL S. LAWRENCE,
ADAM BOUHLY,
In charge of South Draw.

CHARLES RIVER BRIDGE,
September 28, 1868.

I hereby certify that in 1866 3,889 vessels passed up the river through this draw; in 1867, 4,278, and in 1868, to present date, 2,963.

I also certify, to the best of my observation, knowledge and belief, that the average time of the river being closed by ice between Charles river and Warren bridges during the winter months is two weeks. The navigation above the Fitchburg railroad bridge is closed about two months during the winter season.

MOSES WHITEHOUSE,
In charge of Bridge and Draw.

BOSTON, *October* 2, 1868.

I hereby certify that I have no doubt in my own mind but that I have seen as many as 200 vessels pass the proposed site of Maverick bridge in one day; and when a fleet of vessels arrive I do not think the passage of 100 vessels in a day is an unusual occurrence.

It is my further opinion, derived from an acquaintance with Boston harbor made more than 20 years ago as pilot, and fortified by my observation as harbor master for the last eight years, that the ferries, which it is proposed the Maverick bridge may supersede, are of the utmost value in keeping the harbor open in winter, and that without the aid of the ferry-boats the navigation would be much more obstructed by ice than it now is.

JOHN T. GARDNER,
Harbor Master Port of Boston.

BOSTON, *September* 30, 1868.

I hereby certify, to my best knowledge and belief, that one-half of all vessels that arrive in Boston harbor go above the proposed East Boston bridge; in my opinion about one-half the number of vessels arrive in winter that do in summer, or thereabout.

JOHN T. GARDNER,
Harbor Master of Port of Boston.

Number of vessels that entered from foreign ports from April, 1867, to November, 1867, inclusive.

	Number.	Tonnage.
American	472	187,430
Foreign	1,872	364,681
Total	2,344	552,111

Number of vessels entered from coastwise ports during same period, 840; tonnage, 558,661.

ENTERED.

	Number.	Tonnage.
Foreign	2,344	552,111
Coastwise	840	558,661
Total	3,184	1,110,772

Number of vessels cleared for foreign ports from April, 1867, to November, 1867, inclusive.

	Number.	Tonnage.
American	419	151,903
British	1,827	345,896
Total	2,246	497,799

Number of vessels cleared for coastwise ports during the same period, 1,385; tonnage, 686,136.

CLEARED.

	Number.	Tonnage.
Foreign	2,246	497,799
Coastwise	1,385	686,136
Total	3,631	1,183,935

Number of vessels entered from foreign ports from December, 1867, to March, 1868, inclusive.

	Number.	Tonnage.
American	148	55,050
Foreign	284	74,101
Total	432	129,151

Number of vessels entered from coastwise ports during same period, 175; tonnage, 167,868.

ENTERED.

	Number.	Tonnage.
Foreign	432	129,151
Coastwise	175	167,868
Total	607	297,019

Number of vessels cleared for foreign ports from December, 1867, to March, 1868, inclusive.

	Number.	Tonnage.
American	187	66,066
British	279	57,287
Total	466	123,293

Number of vessels cleared, coastwise, during same period, 516; tonnage, 362,044.

CLEARED.

	Number.	Tonnage.
Foreign	466	123,293
Coastwise	516	362,044
Total	982	485,337

NAVAL CONSTRUCTOR'S OFFICE, NAVY YARD,
Boston, October 2, 1868.

SIR: Agreeably to your order I furnish herewith the following dimensions of the several vessels named:

Name of vessel.	Height above lead line.		Draught.	
	To main-top-mast head.	To upper end of lightning-rod.	Forward.	Aft.
	Feet.	*Feet.*	*Feet.*	*Feet.*
Steam frigate Franklin	150.50	210.00	24.25	25.50
Steam frigate Minnesota	149.50	205.50	*	*
Steam frigate Merrimac	151.50	204.50	23.50	23.88
Steam frigate Wabash	149.00	205.00	*	*

* Not known.

SLOOP OF WAR AMMONOOSUC.

	Feet.
Length from fore edge of gripe to after end of spanker boom	354.42
From fore end of jibboom to after end of spanker boom	398.42
Extreme breadth	46.50

IRON-CLAD AGAMENTICUS.

	Feet.
Extreme length	260.75
Extreme breadth	51.75
Draught of water (mean)	12.92

IRON-CLAD QUINSIGAMOND.

	Feet.
Extreme length	345.25
Extreme breadth	56.33

Very respectfully,

EDWARD HARTT,
Naval Constructor.

Commodore JOHN RODGERS, U. S. N.,
Commandant Navy Yard, Boston.

Z 2.

Remonstrance of Messrs. W. F. Weld & Co., merchants of Boston.

BOSTON, *October* 3, 1868.

GENTLEMEN: The undersigned, who have been ship-owners, and transporters of foreign merchandise into the port of Boston for the past 30 years, would respectfully suggest to the commission that a bridge constructed across the channel between the city and East Boston would prove a serious detriment to the commerce of the port; so much so, as to decrease the amount of United States revenue now collected here.

The natural tendency of the business of Boston is to leave us, and if any act like bridging the harbor should be sanctioned by Congress, it will, in our opinion, prove a serious blow to the growth and prosperity of the city. Any one familiar with vessels must be aware, that if a bridge is erected as contemplated, it will nearly destroy the navy yard for government purposes, in fact reduce it from a first-class to a third-class yard; and eventually end in the entire removal of the yard, which we consider would be a great calamity, as in case of war the city would be without its protection. Having a strong interest in the prosperity of the city and the value of the present navy yard to the whole country, we respectfully protest against the erection of the bridge.

Very respectfully, yours,

WM. F. WELD & CO.

Hon. UNITED STATES COMMISSIONERS

With reference to a bridge between Boston and East Boston.

Z 3.

Remonstrance from Boston Board of Trade.

BOSTON BOARD OF TRADE,

Corner of Bedford and Chauncy streets, Boston, October 6, 1868.

GENTLEMEN: I have the honor to hand you herewith the report of a committee of this board appointed to consider the proposition to erect a bridge across the channel between the mainland of the city of Boston and East Boston.

This report was adopted at a meeting of the board held yesterday by a unanimous vote, and was ordered to be presented to the commission, as an expression of opinion adverse to the erection of the bridge. Although it contains some statements of fact which have already been made, its purpose primarily having been to give information to our own members, yet it may not be without its value in confirmation of the other testimony which has been given before the commission.

I am, gentlemen, your obedient servant,

HAMILTON A. HILL, *Secretary.*

Hon. COMMISSION

On the proposed Maverick Bridge, Charlestown Navy Yard.

Copy of report.

The committee appointed to consider the proposal to erect a bridge between Boston and East Boston beg respectfully to report:

Late in the session of 1868 the legislature of this Commonwealth granted an act of incorporation to certain citizens of East Boston under the

name of the Maverick Bridge Company, and authorized and empowered them "to erect a bridge over the water between the mainland in the city of Boston and East Boston, and to purchase or otherwise take and hold such real and personal estate as may be proper for that purpose."

This charter was given, not in consequence of any special requirements of the general business of the city, nor in response to any urgent demand for it on the part of the commercial community, but simply to supply what was supposed to be needed in the way of additional facilities of communication between East Boston and the city proper. It was initiated as a local measure; it has been advocated almost exclusively by the residents of a single locality; and whatever advantages may result from it, if consummated, will enure chiefly to that locality.

Two questions suggest themselves in attempting to determine the expediency of this plan for connecting East Boston with the mainland of the city: Will it accomplish for the people of East Boston what is claimed to be needed by them? If it shall do this, will it or will it not be at the expense of other interests more numerous and more important than those which it will serve?

1. Will the proposed bridge afford to the people of East Boston such means of communication with the city proper as they desire? No one will deny that every adequate facility should be supplied for intercourse between different parts of the city, so far as circumstances may permit; and there is, probably, no difference of opinion on the point that hitherto connection between East Boston and the mainland has been less perfect and complete than it ought to and might have been. The deficiency which has thus existed furnished the ostensible reason in view of which the legislature incorporated the Maverick Bridge Company; and, without it, this action probably could not have been secured. But recent improvements in the management of the East Boston ferries illustrate what may be attained by this method of uniting the two shores of our harbor, and the extent of the traffic successfully maintained by ferry companies in other harbors indicates the degree to which it might be accommodated in our own. If our present purpose were to ascertain how and in what manner to furnish to East Boston the best communication with the city, it would not be difficult to show that everything really necessary could be gained by a still further improvement of the ferry system, by a gradual multiplication of ferries, and ultimately, perhaps, by a tunnel under the channel. We are limited, however, in this discussion to the merits of the bridge which the people of East Boston are now proposing as the agency for supplying the want of which they complain; and from all the evidence at our command we are convinced that this will not be what is claimed and promised in its behalf. The counsel for the bridge company, in the course of the pending inquiry before the naval and military commission at Charlestown, has stated that the necessities of the commerce of the harbor are to be treated as paramount to the convenience of the bridge traffic in the management particularly of the draw. There is nothing in the act which can be construed into a recognition in any form of the rights of commerce, or which can be made available in case of need for its protection; but supposing the company to be magnanimously disposed in this regard, what will be the result? A careful estimate makes the number of vessels passing and repassing during the year that part of the harbor which is to be spanned by the bridge at least 33,000. The time occupied by schooners in going through the draws of the Chelsea and Charlestown bridges varies from two to fifteen minutes, and averages at least five minutes for each. It takes, as we are informed, four and a half minutes simply to open and close the draw

of the new bridge at Newburyport, which is only 190 feet in length. The draw of the proposed East Boston bridge, according to the plan of Mr. Pratt mentioned in the act, will be upwards of 490 feet in length, more than twice the length of the State-house, as stated by Mr. Francis, of Lowell, the eminent civil engineer, in his speech in the legislature last June, nearly three-fourths of an acre in its area, and upwards of 2,000 tons in weight. To move this enormous structure by steam power even, and to give passage to a Liverpool packet, an Indiaman, or a frigate (supposing such vessels to be allowed to incur the risk of passing through the opening, which is very doubtful) will certainly require, under ordinary circumstances, from 12 to 20 minutes. Allowing only five minutes each for every description of craft which may possibly use the draw, it would appear that the traffic across the bridge will have to be suspended seven hours and thirty minutes on the average in every 24 hours, or for nearly the time which is beginning to be accepted as a working day. But Mr. Bartlett, who is competent authority on such questions, has given the opinion that the average of 12 minutes is very moderate calculation; and this, supposing the number of passages through the draw to be uniform day by day during the year, (which it will not be,) would occupy 21 hours of every secular day, or if both openings of the draw should be used equally, 10½ hours daily. What then will the residents of East Boston gain by the construction of this bridge, if the travel upon it is to be liable to such a degree of interruption as this? With all their complaints against their ferries they have been put to such inconvenience by them as the bridge would entail, supposing them to accept of this instead of the ferries, and supposing also the necessities of commerce to be respected and conformed to. It is true that no obligations have been asked for, and no assurances given that after the completion of the bridge one or more ferries will not still be insisted upon; and there is little doubt it is intended to use the bridge, not in lieu of, but in addition to the ferry system of communication. But even as a supplement to the ferry transit, how much will the bridge be worth practically with a gap of 400 feet opening midway in its span during one-third to one-half of every four and twenty hours, and in fact, during three-fourths, on the average, of the time between sunrise and sunset? And this being so, will not every inducement exist to lead the company so to manage the bridge in the interest of the people of East Boston, at whose instance and for whose benefit solely the charter was given, as seriously to impede the general commerce of the port? This suggests the inquiry—

2. Will the advantages anticipated by the citizens of East Boston, if they shall be secured, be purchased at the expense of the prosperity of the port? In the consideration of this part of the subject, it should be remembered that East Boston is not only included within the limits of our port, but belongs also to our municipality. It is an integral part of Boston, it is vitally concerned therefore in the welfare of the city, and it cannot afford to acquire a possible local advantage at the hazard of the general good. If the erection of the proposed bridge shall prove mischievous and calamitous to the city at large, it will eventually and inevitably work to the injury of every part of the city in its industry and in the value of its property. This is not in the broadest aspect of the case an East Boston question, and it should be weighed by the people of East Boston not as the inhabitants of a particular ward, but as citizens of Boston. By many of them, indeed, it is thus considered, and hence the difference of opinion in reference to it, which exists, as is known, even in East Boston itself. Again, it should be borne in mind

that there is a cluster of cities resting upon the waters of our harbor and practically constituting this port—Boston, Charlestown, Chelsea, and Cambridge, and that the trade and advantage of each of these ought to be taken into the account whenever the capabilities and conveniences of the harbor are to be changed or diminished. Some of these cities have extended their emphatic protest against the new barrier which it is sought to interpose between them and the sea. The mayor of Cambridge has told the commission at the navy yard that his city stands prominent in commercial importance in the Commonwealth; that its valuation amounts to $33,000,000; that its wharf property is estimated at $2,000,000, and that the business transacted in connection with this is not less in value than $5,000,000. He believes that this business will be fatally affected by the erection of the bridge, as in effect it will increase the distance from the ocean and will add to the cost of coal and other commodities which are water-borne. It has been truly said that every bridge thrown across navigable waters is more or less an obstruction to navigation; and we have it on authority, that it now not unfrequently requires a longer time to take a vessel from Boston to Old Cambridge, than to make the trip from Philadelphia to Boston. We can well understand, therefore, why the municipal authorities and the property holders of that city should raise their voice against any additional structure threatening to render their communication with the coast more difficult and expensive. But if Cambridge, which has become somewhat accustomed, if not reconciled, to an interrupted and embarrassed channel to the sea, earnestly objects to any further impediment, it is not strange that Charlestown, with its unsurpassed water front, with its large foreign commerce, and with its access to the ocean hitherto as free as that of Boston, and as easy as that of any city on the coast, should be alarmed at this proposal to reduce it to the position of anything but a first-class port, and should in self-defence bring all proper influence to bear against the schemes. It has been given in evidence that upwards of 150,000 tons of ice have been shipped from Charlestown in a single year. One well-known company load with ice, at their wharves there, from 350 to 400 vessels annually, 60 or more of these going to the East Indies, and returning with cargoes of valuable merchandise. The only railroads connecting this port with the north and the west, which come to deep water, have their terminal wharves at Charlestown. There, too, is the navy yard, fitted up at an outlay of $30,000,000, and at which the arrival and departure of vessels in 1867 were 383. We venture the opinion that never before in the history of commerce was a proposal seriously entertained to bridge a channel thus dedicated to marine enterprise and to the public service.

But how will Boston itself be affected by the contemplated bridge? Our people do not propose to relinquish for all future time the foreign trade which has so greatly benefited and enriched them in the past. In common with other cities on the coast, we have suffered a decline in our tonnage, and enterprise and capital formerly employed upon the water have found temporary absorption upon the land. But circumstances will change all this, and in due time the shipping interest will revive and will prosper as in years gone by. It is for us to decide whether we will participate in this revival, and whether we will be prepared for it by maintaining the integrity of our harbor by adding to its conveniences and by affording the freest possible opportunity of interchange between the railway freight car and the ocean vessel. It is only necessary, in order to show the utter incompatibility of all this with the plans of the Maverick Bridge Company, to quote the state-

ment of General Foster, that the proposed bridge will take nearly 2,000,000 square feet from the area of the harbor, or nearly one-half of the present anchorage ground suitable for large vessels; and the further statement of Mr. Bosche that there are now only 120,000 lineal feet of wharfage unobstructed by bridges, and that the Maverick bridge will cut off and reduce this to at least one-half. Can we afford to build over the area indispensable for the movement of large sailing vessels and steamers as they come from or go to sea? Can we afford to dispense with such wharves as Union, where the Calcutta trade has been largely accommodated, or Constitution, where the English trade has centred? And in addition to all this we have the opinion of eminent scientific men, neither contradicted nor disproved, that such part of the harbor as may remain unoccupied after the erection of the bridge will be seriously imperilled by the changing of the currents, by the checking of the flow of the tide, and by the "shallowing" of the water in the main channel by the driving of piles and by the construction of the piers. The question, therefore, is simply this, whether the harbor of Boston shall be sacrificed at the request of a few citizens of one of our wards, for their supposed personal advantage. To this the merchants of Boston, and the Board of Trade, so far as it has the right to speak in their behalf, can have but one reply to give. They propose to preserve their harbor intact, and they will never cease to oppose any project calculated to diminish and to destroy its trade.

By the courtesy of the navy and army commission already referred to the members of this committee have been permitted to attend the hearing before them at the Charlestown navy yard, and many of the facts communicated in this report have thus come to their possession. The papers presented to the commission by General Foster, Mr. Thayer, Mr. Bosche, and Mr. Bartlett contain a breadth of statement, an accumulation of testimony and a strength of argument which leave little more to be said, and to these, with the evidence of Professor Peirce, the legislative speech of Mr. Francis, and the veto message of Governor Bullock, the members of the board are respectfully referred for an exhaustive discussion on the subject. With these witnesses, so competent, so unprejudiced, and so unreserved, the judgment of the past and present commandants of the navy yard, the harbor commissioners, the collector of the port, and the largest ship-owners of Boston, fully concur, and against them no one has yet ventured to appear. No merchant has been found willing to go to Charlestown to declare that there is any necessity for the erection of this bridge, or that it would be safe to build it. The bridge company have said that they have witnesses in New York, in Chicago, and in Canada, who, if they were here, would support their scheme; but no one nearer home, it would seem, or who is identified with the prosperity of this community, is willing to advocate the closing up of the main channel of this port to the imminent jeopardy of its ocean commerce.

This board did not act when the petition of the East Boston people was before the legislature last spring, because it was generally supposed to be impossible that the charter asked for would be granted, and because, also, it was thought that the opposition presented by individuals and corporations more immediately concerned would be sufficient and successful. The refusal of the legislative committee to report a bill, and the veto subsequently by the governor of the bill introduced on leave, indicate the force of the considerations which had been urged against the measure; but, unfortunately, they did not prevent its passage at almost the last moment of the session. The report of the joint com-

mittee on the harbor of the city government of Boston against sending a petition to the legislature in aid of the bridge, and which was concurred in by both branches, is appended to this report. But we must not be taken unawares again, and especially now that the field of action has been changed from Boston to the national capital. It is respectfully recommended, therefore, that this report be transmitted to the honorable commission now in session at the navy yard as an expression of opinion most decidedly hostile to the erection of any bridge across the channel between the mainland of the city of Boston and East Boston; and further, that this board memorialize Congress at its next session to the same effect.

Respectfully submitted.

BOSTON, *October* 5, 1868.

Attest:

HAMILTON A. HILL, *Secretary.*

BOSTON BOARD OF TRADE,
CORNER OF BEDFORD AND CHAUNCY STREETS,
Boston, October 7, 1868.

GENTLEMEN: I ask permission to make a slight correction in the paper which I had the honor to present to you yesterday, in reference to the business transacted at Charlestown, and especially by the company of whom mention was made. The statement should read as follows:

From 350 to 400 vessels are loaded there with ice annually; 60 or more of these by one well-known company, more than half of them for the East Indies, and returning with cargoes of valuable merchandise.

I am your obedient servant,

HAMILTON A. HILL, *Secretary.*

HON. COMMISSION
On the proposed Maverick Bridge, Charlestown Navy Yard.

APPENDIX.

Action of the city government of Boston.

Ordered, That his honor the mayor be requested to petition the legislature at its present session in aid of the petition of Nehemiah Gibson, and others, for an act of incorporation for the purpose of building a bridge between Boston and East Boston; and that the committee on bridges be instructed to render such aid and attention to the same as the interests of the city in their judgment shall require.

In Common Council, February 20, 1868.—Referred to the committee on the harbor. Sent up for concurrence.

CHARLES H. ALLEN, *President.*

In Board of Aldermen, February 24, 1868.—Concurred.

GEORGE W. MESSINGER, *Chairman.*

CITY OF BOSTON, IN BOARD OF ALDERMEN,
April 13, 1868.

The joint standing committee on Boston harbor, to whom was referred the order authorizing the mayor to petition the legislature in behalf of

the city council in aid of the petition of Nehemiah Gibson, and others, for a charter to build and maintain a bridge between ward one and ward two, beg leave to submit the following report:

Any enterprise which has for its object more direct communication between East Boston and the city proper is deserving of very careful consideration. For many years a large number of our citizens, residing or doing business in that section of the city, have been dissatisfied with the accommodations afforded by the ferries, and various schemes for their relief have been presented to the city government. The first question which we are called upon to consider, before committing the city to any scheme, is whether more direct communication can be furnished at our expense, which the amount of travel would warrant, without too seriously interfering with other interests important to the prosperity of the city. The committee have given several public hearings to persons interested in the project, and have examined different designs for bridge structures, prepared with a view to reduce to the minimum the interruption of navigation. They have also examined a plan for the construction of a tunnel, which is pronounced by skilful engineers entirely practicable.

The committee were desirous of obtaining such information as would enable them to form an opinion upon the extent of the obstruction to navigation from a bridge, and whether the piers upon which it rested would have an influence upon the tidal currents injurious to other portions of the harbor.

It is unquestionable that a bridge would form an obstruction more or less serious, according to its height above the water, the number of draws, and the manner of opening them, to vessels visiting the wharves along that extensive water front between the line of the late People's Ferry Company and the bridges across Charles river, Mystic river, and Chelsea creek. Such being the case, the ultimate authority over the subject is, in the opinion of the city solicitor, vested in the Congress of the United States. In regard to the injury which might result to other portions of the harbor from the construction of piers in the channel, we have not received any data upon which an intelligent opinion could be based. It would take considerable time to obtain accurate information upon the points in which the city's interests are mainly concerned, and until such information is obtained we do not consider it expedient for the city council to give its sanction to the enterprise.

The committee would, therefore, respectfully report that the order ought not to pass.

For the committee:

J. D. BRAMAN, *Chairman.*

In Board of Aldermen, April 13, 1868.—Read and accepted. Sent down for concurrence.

G. W. MESSINGER, *Chairman.*

In Common Council, April 16, 1868. Concurred.

CHARLES H. ALLEN, *President.*

A true copy. Attest:

S. F. McCLEARY, *City Clerk.*

Z 4.

Professor Benjamin Peirce, Superintendent United States Coast Survey, opposing the bridge.

To the honorable the Commissioners of the United States upon the establishment of the Maverick bridge:

The undersigned respectfully states that, having regarded this commission as especially intended to obtain an impartial judgment, unbiassed by the previous expression of opinions, and having himself entire confidence in the wisdom and the experience of the board now sitting, and in their acknowledged ability to consider all the questions involved in it, he has thought it more judicious that he should not take a prominent position in reference to the issue. But he trusts that it will be received as a proper performance of his duty if he simply states that he has continued his consideration of the subject with unabated interest, and that his inquiries confirm him in the opinions which he has repeatedly given. He believes that no bridge can be built to East Boston which will not delay navigation much more than it will facilitate trade; that for every ton which will be expedited in transit over the bridge there will be many tons obstructed in the passage through its draws, and that the gain to the real estate of East Boston will be more than equalled in the loss of value of the wharves. The piers of the bridge will be an obstruction to the ice, and will serve to keep it accumulating above the bridge to the manifest injury of a very large commerce. Each pier will also be a contraction of the channel for the flow of water, and will accelerate its velocity, from which would result the same kind of injury as that to which the harbor of Boston has already been subjected by the bridges across the Mystic and Charles. The scouring influence of the water would be increased, and material taken from the bottom in the vicinity of the bridge would be carried into the harbor, where it would be deposited with the previous deposits at those points just where the harbor is most vulnerable. In one word, then, it would appear that while the proposed bridge may be a small local benefit, it must be a great public injury, and especially injurious to the navy yard at Charlestown.

All of which is respectfully submitted.

BENJAMIN PEIRCE,
Superintendent United States Coast Survey.

CAMBRIDGE, MASS., *October* 3, 1868.

Z 5.

Statement of amount of commerce of Brighton above the bridges.

BRIGHTON, *October* 2, 1868.

DEAR SIR: We hand you, for such use as you think proper before the commissioners in the matter of the bridge proposed to East Boston, the following statistics of business done by water on the Brighton side of Charles river, above the mill-dam, during the year 1867. This year the amount is larger, but cannot at present be got at accurately.

Very respectfully, yours,

J. G. & N. G. GOOCH.

Hon. L. HALL, *Mayor of Charlestown.*

By G. Fuller & Son,	45	vessels lumber, &c., amounting to	$135,000 00
By J. G. & N. G. Gooch	43	vessels lumber, &c., amounting to	132,000 00
By E. Abbott	25	vessels lumber, &c., amounting to	55,000 00
By E. Willard	29	vessels lumber, coal, and wood	60,000 00
By A. Brackett	29	(estimated) coal and wood, about	60,000 00
	171		442,000 00

(Submitted by W. W. Wheildon.)

Brighton is almost at the head of navigation in Charles river, being seven or eight miles by the river from Charles river bridge.

Z 6.

Statement of Mr. Clemens Herschel, civil engineer, against the bridge.

GENTLEMEN: At the request of J. B. Thayer, esq., I have the honor to present the following account and description of the drawbridge at Brest, France, there known as the "Pont Impérial de Brest." The information given is from a description printed on page 623 of the volume for 1863 of the Prussian journal for engineering and architecture, (Zeitschrift für Bauwesen,) from the dimensions given me in writing at Brest, and from a personal examination made in May, 1866.

The bridge stands at the entrance from the harbor into a dock or basin of the navy yard, (on the left-hand side heading up Brest harbor,) and consists of two equal parts, each part composed of a long and short arm, and turning on a circular pier erected at the edge of the shore or quay-wall. From the centre of these piers to the end of the long arms (the middle of the bridge) is 192 feet; similarly, the length of each short arm is 93.1 feet. Thus the whole length of the bridge is 570.2 feet, and the clear opening—both halves opened—is 346.8 feet, the diameter of the piers at the bottom being 37.2 feet. The width of the roadway is 23½ feet. All these and the following dimensions will be readily understood by reference to a tracing of an engraving of the bridge, taken from the journal above mentioned, herewith enclosed.

The clear height under the middle of the bridge at low water is 92.5 feet. The description of the bridge given me at Brest is headed "Le pont impérial est fait pour donner passage à un vaisseau, ½ marée." (The imperial bridge is made to pass a vessel at half tide.) From what was told me on the spot I came away with the impression that this bridge had seldom, if ever, since it was finished, been opened to let a vessel pass through. I was told at Brest that it was only made a *draw*-bridge, so that in case of war, if a vessel wanted to take refuge in the basin of the navy yard at *high* tide, the bridge could be opened for that purpose. Vessels of war—other vessels, with the exception perhaps of some fishing smacks, have no business beyond the bridge—when they wish to enter the dock, do so, as I understand, at low tide, and, if necessary, by lowering their top-gallants. Vessels of war do not pass under or across the line of the bridge on arriving, or when stationed at the port of Brest. I think they would have no occasion to do so, except when about to be docked for repairs, or in the emergency of running to a land-locked place of shelter when pursued by the foreign enemy. There were three or four vessels of war, one an iron-clad, lying in Brest harbor at the time of my visit, all outside of the bridge. Vessels of commerce have nothing whatever to do with this bridge.

The following is a literal translation of the description above referred to, as far as it relates to the weight, cost, and the means and manner of turning the bridge:

Each arm of the bridge consists of two trusses, connected by cross-girders, and revolves on 50 rollers of 1.64 foot mean diameter and 1.97 foot length. The diameter of the circular track is 29.6 feet; the weight of the revolving parts is 5,900 hundred-weight, or 295 tons. In calm weather only two men are necessary to open or shut one arm of the bridge, for which only 15 minutes' time are required. Since, on account of so many rollers, &c., many repairs and adjustments may necessarily be expected from time to time, four hydraulic presses have been placed on top of the piers, under the trusses, which can at any time lift the whole body of the bridge a couple of inches.

The total weight of the iron in the bridge is 16,930 hundred-weight, or 846.5 tons, to which must be added the counter weights of the short arms of 6,650 hundred-weight, (and weight of roadway,) so that each arm weighs about 12,000 hundred-weight, or 600 tons. The total cost of the bridge was 84,751 pounds sterling.

I have the honor to remain, very respectfully, your obedient servant,

CLEMENS HERSCHEL,
Civil Engineer.

To the honorable COMMISSION
Appointed under a joint resolution of Congress in relation to the proposed building of a bridge in Boston harbor.

BOSTON, *September* 29, 1868.

GENTLEMEN: At the request of parties interested I have the honor to enclose herewith, for your service, a copy of the Boston Daily Advertiser of September 19, 1868, containing an article written by me on the subject of the "proposed Maverick bridge and communications with East Boston generally."

I have the honor to remain, very respectfully, your most obedient servant,

CLEMENS HERSCHEL,
Civil Engineer, No. 6 Joy's Building, Boston.

To the honorable COMMISSIONERS
Appointed under a joint resolution of Congress in relation to the erection of a bridge in Boston harbor.

THE PROPOSED MAVERICK BRIDGE AND THE SUBJECT OF COMMUNICATIONS WITH EAST BOSTON GENERALLY.

To the Editors of the Boston Daily Advertiser:

The novelty of the proposition, the very various influences that were originally brought to bear on this project, or what might be called the days of excitement, have all passed away; so, also, there has not lately appeared anything in the daily press on this subject, and those articles that appeared some time ago treated of the matter in a general way only. The time and opportunity seem both fitting for a purely expert examination and discussion of a subject of so much public interest.

Granting, then, that the "safety and convenience of the inhabitants of the city of Boston require" that additional and better means of communication be provided between East Boston and the city proper, and waiving the right to object to any one method without proposing another as better, the question becomes, what shall those means of communica-

tion be? It is no longer bridge or no bridge, but, also, if not a bridge, what then? This broad view of the question is one the legislative committee of last year would not take, nor can a demand so to do be well made upon any future commission, appointed merely "on the petition of the Maverick Bridge Company," &c., but to the thinking public at large such a view comes on these accounts only the more welcome.

To accommodate, then, the shipping in the harbor as well as land travel to and from East Boston, there can be suggested a bridge up high enough to allow vessels to pass under; a bridge with a draw in it; a submerged—say in 25 feet of water at low tide—tubular bridge; a subway or tunnel whose top should be say even with the bed of the river; and lastly, one or more ferries, which may have various motive powers and landings of various constructions. On account of the level character of the two shores, the East Boston side especially, the first suggestion will hardly be found practicable. The second suggestion has been the main one under consideration, and the objections thereto can be simply stated. They are an encroachment on the area of the harbor and a barrier to the passage of vessels above the line of the proposed bridge. I purposely leave out the objection that the bridge may result in any detriment to the harbor as far as its depth is concerned, for with a proper construction of piers and ample distance between them—in other words, by leaving the water-way undiminished, and which it would be the duty of the mayor and aldermen to require—no danger need be apprehended from this source. An examination of the map of Boston will prove to any one how very largely any low bridge would diminish the area of Boston harbor. It was testified last winter that the English steamers, in leaving their docks at East Boston, and any steamers from docks on the Boston side equally distant from the line of the present ferries, inevitably cross this in backing out so as to get bow on stream, while frequently they thus back up to within a short distance of the navy yard before they are able to get fairly turned. A low bridge would not permit of this and other free movements of vessels.

A perfect mass of testimony was introduced to prove that the proposed draw would not be a serious barrier to either navigation or land travel, but it might, with no great impropriety, have been ruled out, the whole of it, as irrelevant to the subject. The draws cited and held up as parallel cases were those at Providence, Albany, and Chicago, the second named especially; but what have these cases really in common with the proposed draw? At Albany they have a single-track railroad bridge say 15 feet wide, and schooners and small craft generally, drawing four or five, say even 10 feet of water, to pass through. Here it is proposed to have a drawbridge 85 feet wide and 400 and odd feet long, and vessels of the deepest draught, drawing 20 and 22 feet and over, must pass through. So at Chicago; they have drawbridges about 25 feet wide by 250 feet long, and only small vessels passing through under tow, and yet, as will presently appear, the less said about Chicago the better for the reputed non-obstructive character of drawbridges. There are vessels that now go over the site of the proposed East Boston bridge that would go through or over the kind of vessels that pass the Albany or Chicago bridges without hardly feeling the shock, and the tug that will have complete command of the one will move the other only slowly, and not as it wills. The fact is, no testimony can be introduced to prove that large vessels will not be seriously inconvenienced in passing through a draw such as proposed, because nowhere on this globe have the inhabitants of any seaport yet followed the suicidal policy of bridging their harbor right in the track of heavy shipping.

The reasonably to be expected interruption to land travel over the bridge, by the length of time the draw will be open, is too ably and irrefutably set forth in the speech of Hon. James B. Francis, printed in the Advertiser of June 6, to allow of further remarks thereupon. Taking a very lenient view of the difficulties to be overcome, Mr. Francis estimates that the bridge will be useless for travel on an average eight hours per day. If the draw be made of the proposed size, which is given above, it will weigh 2,000 tons at least, hence cannot be opened and shut like the comparative trifle of 100 or 200 tons, a usual weight for drawbridges; if made smaller, the obstruction to navigation becomes so much greater.

There might yet be added, that when, as usual, the draw-tender is a paid servant of the bridge company, and not of the ship-owners or masters, it is the shipping that has to suffer, and land travel is favored. There is too much harm done to commerce in this way now, making, as it does, the passage from Boston harbor to Old Cambridge take as long, not unfrequently, as from Philadelphia to Boston. And what practical redress has a ship-owner when, through the delay of that "master of the situation," the draw-tender, he "loses a tide?"

I have said that there was no precedent for a drawbridge in the track of heavy shipping. Looking about a little, let us see if there be any chance of one being shortly forthcoming. At New York a high suspension bridge is talked of. At Chicago they are building a subway under the river, and progressing well. (See Scientific American for September 16.) It matters little if this or that shiftless contractor allows a bank to cave in on him, as has twice happened, and has then been telegraphed and copied in all the papers, from Chicago around by way of the whole United States, England, the Indies, and New Zealand (almost a fact) to Chicago again, as "Failure of the Chicago tunnel?" Any one who has had direct communication with the Chicago Board of Public Works, or the eminent engineer of the same, cannot admit the doubt not only that this first Chicago subway will be finished, but also that, in all probability, it will be followed by several more. So at Calcutta; no one has lately as much as proposed to bridge the Hooghly in front of the city, in order to bring the railroads over and accommodate land travel besides; the question has been, whether to build a submerged bridge or subway under, for teams and railroads, or whether to let teams go on ferries and bring the railroads across several miles up stream where shipping does not go, like the Grand Junction railroad here. (See "Engineering" leaders for last couple of months, which favor the subway plans.)

As a private personal opinion I should object to the proposed Maverick bridge also on account of its designing to be a toll-bridge. The exaction of tolls, whether on bridges or highways proper, is to-day nothing but a relic of barbarism, or at best of the feudal ages, and it is a disgrace to Boston to have so many as it yet has on its very outskirts. The right to move from one part of the city to any other, over any road or kind of road, ought certainly to be as free as the will to do so. Hence I believe the inhabitants of Boston can do better than to plant a new toll-house between two of their wards.

The third and fourth suggestions were a submerged bridge or a subway of brick or stone. That both of these are practicable the great majority of the engineering profession will assure any one who may be disposed to be doubtful about it. At London the old Thames tunnel has now a railroad running through it; a brick and iron subway is being built, or is perhaps already done, for the Pneumatic Despatch, and several more have been projected. At Calcutta, as already mentioned, subways are the favorite, and at Chicago the chances are that next

spring any one so disposed may drive or walk under the Chicago river from one side to the other. I had the honor to explain, with models and drawings, to the committee on harbors of the city council, last March, at which hearing were also present the State harbor commissioners and many well known civil engineers, a method for building a subway between Boston and East Boston. The proposed plan (and, no doubt, many more can be devised) was pronounced perfectly practicable; indeed, there is so little novel about it, consisting as it does in the main of an application of known methods to a new use, that on this score there need be very little doubt. About a year previous to this hearing, as also a short time after it, the subject was also presented before the Massachusetts Institute of Technology. The committee above named, it will be remembered, reported against the proposed bridge—being the only one that judged on the subject in a broad spirit and with regard to the whole of Boston. But for all this I am reluctantly compelled to acknowledge that I do not think the chances that a subway to East Boston will shortly be built to be very good. The Maverick Bridge Company have preferred to run in the very teeth of all the opposition that could naturally be expected to result from the proposal of a fixed bridge rather than invite the general aid and good-will of all citizens of Boston by working on this plan of amelioration, which would interfere with no one. After the Washington street subway in Chicago will have been completed and followed by a few more, then, perhaps, enough citizens of Boston and East Boston will have strayed out that way to organize and build one here in humble imitation of those out west. Or had we a Boston board of public works like the one in Chicago, the thing might be done so much the sooner as a public work. With all our civilization we are yet in a very crude state as far as public works are concerned. Their cost—more than that, the possibility of their execution, is mainly dependent on a few individual contractors, not on the public spirit. If no man is rich enough, or, what happens oftener, being rich enough, does not wish to enter into any undertaking without an almost certainty of very great gain to himself, then the project cannot be executed. Especially is this true in the case of new or novel undertakings, or such that cannot be finished in one year—*i. e.*, under one administration. But this is a subject by itself, to which, before very long, I feel sure the public mind will earnestly be directed.

The last suggestion in the list is perhaps the one best suited for the times, and there remains to be examined how the ferries shall be managed, propelled, and how the landings shall be constructed so as to make an improvement on the present inadequate arrangements. In the first place, then, the fact that when one line of ferries was found insufficient, two lines of boats were not placed on the route, savors so unmistakably of monopoly or some other disregard of public wishes, that to cut this Gordian knot and henceforth be enabled to run as many lines as the public may need, the whole care, right, and title of the ferries within its own limits should be placed in the hands of the city of Boston. Whether or not to make them free can be decided afterwards, according as it would or would not be for the interest of the city. The next step would be to improve the ferries themselves. With respect to their power, it is worthy of strict investigation whether it would not be better to have them propelled in the following manner, which has been in operation at Plymouth, England, for the last 30 odd years, and has been imitated and improved on in detail at many places in England, and at two crossings of the Rhine, in Germany. One or two chains, latterly wire cable, are laid across the river and the two ends of each are weighted

with several tons; said ends are then run over a pulley and left hanging in a well-room, so as always to keep the cables at a certain tension. Instead of the paddle-wheels at the side of the ferry-boat, two large pulley-wheels (grooved) are mounted on the axle, and the above mentioned cables are made to "take a turn" around them, one on each side. Then revolving the wheels the boat pulls itself along to the other side, the cable falling to the bottom again astern of the boat. Of course, this would not allow of three boats using two landings, as at present. The advantages are, less power required to move the boat, less time required to cross, and less to make fast, the boat of necessity always running directly into her berth and staying there till started the other way. At Plymouth, (see Trans. Inst. Civ. Engrs. 1838,) the ferry route is 2,550 feet long, rise of tide 18 feet, nearly five-knot current, and water 96 feet deep at high tide. Boat runs at right angles to line of current. Similar ferries are at Portsmouth, Saltash, Southampton, and no doubt at other places in England. Also at Griethausen, on the Rhine, since 1865. At Rhinehausen, also on the Rhine, there are six of these ferries side by side, to accommodate the very large coal traffic at that point. Difference between high and low water 25 feet, 2½ to 4½ knot current. Each ferry is capable of transporting from one depot to the opposite one, six freight cars or five European passenger cars every 15 minutes. A bridge was not allowed here on account of military or stragetic reasons. (See the Prussian Journal for Engineering and Architecture, 1867.) All these ferries are for railroad purposes.

So much for the motive power; the construction of landings, however, demands with us immediate attention and improvement. In case of common land travel the landings are much easier built than in the cases cited above. In the last mentioned one, the engines run directly down to the boat, and can even be shipped over themselves. Ferry landings can be divided into two principal kinds, one where the boat always runs the same distance and lands her freight on a platform moving perpendicularly up and down with the change of the water level, the other where the boat runs further and further in-shore as the water rises, and lands her freight on a platform that shifts back and forth, as well as up and down. In the first case, when the connection between the landing and the shore is made by a single span bridge, as has been usual hereabouts, this bridge becomes too steep for convenient use both at low and high tide. But there is no necessity of this. At Liverpool, where the tide rises about twice as high as here, the connection is made by means of a pontoon bridge, so that at low tide the pontoons nearest the shore rest directly on the bottom, and at no time is the grade steeper than 1 in 20, less than $\frac{5}{8}$ inch to the foot. (See above mentioned German journal for 1863.) This is perfectly applicable here in Boston, with less difficulty moreover, on account of the tide being less. Never having examined them, I am unable to state just how the New York landings are made, but that they must be better than those here, the greater amount of travel they accommodate seems to prove. The second system of ferry landings, above mentioned, is also applicable here. It has therefore been generally used in conjunction with the wire cable mode of propulsion, but it is not necessarily an adjunct of that kind of boat alone. It could, with only some slight alterations, be used also to serve the present kind of boats.

I have hardly as much as given an outline of the various appliances that have elsewhere been used to make ferry boats do more work themselves and exact less work from their patrons in getting on and off them, but hope to have indicated enough to prove that the ferry accommoda-

tions between Boston and East Boston can be much bettered. That they can be made as good for land travel as a bridge without a draw or a subway, I do not undertake to say, but placed in hands that will cater to the needs and wishes of the public, and only reasonably improved, (the railroads to enter East Boston by way of the Grand Junction tracks,) I believe to hazard nothing in claiming that they will then well accommodate all the travel to and from East Boston that may be anticipated for many and many a year yet to come.

C. H., *Civil Engineer.*

BOSTON, *September* 15, 1868.

Z 7.

Final argument of counsel for the bridge company.

Before Admirals S. H. Stringham and C. H. Bell, and Brigadier General J. H. Simpson, United States commission now sitting at the Charlestown navy yard.

Explanatory and rebutting statement on behalf of the Maverick Bridge Company:

1. A great variety of statements and statistics have been introduced before the commission, which the said company allege are entirely unreliable and exaggerated, but which we have not been able to reduce to their fair value, because by the ruling of the commission we have not been allowed to see the witnesses face to face, nor to exercise the right and test of cross-examination.

Some of these loose and random statements, material to the limited issue before the commission, will be hereafter noticed.

2. The company have a large mass of evidence and statistics controverting statements introduced by the opposition, but as these in many instances have been ruled upon by the commission as irrelevant and unnecessary, and have been once passed upon by the legislature of Massachusetts, who have the peculiar and exclusive jurisdiction to determine the public necessity concerning them, and because the commission have intimated the opinion clearly that they were not to be considered by them in their decision, we refrain from introducing the same.

3. Of matters material to the issues before this commission and to the United States, the first is that presented in the statement of Brigadier General J. G. Foster, respecting the number of vessels in this part of the harbor, and the time of moving the draw, &c., &c.; statements repeated in various forms and by various persons before this commission.

Respecting this statement, General Foster was notified when preparing it that the figures he was employing were not to be relied on; he has, nevertheless, seen fit to use them, and has not introduced a record, an affidavit, or voucher of any kind to support them.

Of the vessels at wharves, their number is avowedly fixed only by his own random estimate.

I understand the fact to be, as has been stated by the collector of the district, that there is no exact and indisputable record of the whole number of vessels entering this port in any given year.

But there are independent sources of evidence that will settle the maximum number within a very close approximation and beyond any reasonable doubt.

General Foster represents the openings of the draws of all the bridges for one year to have been 16,486. Of course, on this statement the number of vessels passing them—as the same go up and come down—is nearly one-half the openings, say 8,243. He then estimates that at least an equal number of vessels were at the upper wharves, but furnishes and refers to no basis for this opinion, (it is merely an opinion,) say 8,243; making the whole number of vessels above the bridge to have been 16,486, and the whole number of openings of the proposed bridge to be, yearly, 32,972.

In the first place we caused careful examination to be made by a responsible person of the whole number of vessels at the aforesaid wharves, and the figures, as will be seen by his affidavit presented herewith, were obtained from the wharf records themselves. They are subject to one source of uncertainty, and that is that a large number of vessels visited and were counted at several wharves.

The whole number counted as being at all of the said upper wharves was 5,164. Certificates of the various draw-tenders accompany this statement, showing that the whole number of openings for that year was 9,510; making the whole number of vessels passing the draw to have been 4,755. These certificates show that these figures are to an extent uncertain, as no reliable records were made of such passages, and none are now to be referred to.

Making no allowance for the number of vessels that were duplicated and triplicated at several wharves, but taking the broadest and largest account, and allowing also the unauthenticated statements respecting the bridges, and these facts show the whole number of vessels above the line of the proposed bridge not 16,486, as represented by General Foster, but, as shown by record and certified evidence, 9,919.

We have to submit, also, that there is other evidence of the highest value that confirms these figures.

The 14th annual report of the Boston Board of Trade contains tabular statements of the whole number of vessels entering the district of Boston and Charlestown, in both the coasting and foreign trade, for the last 13 years:

Year.	Coasting trade.	Foreign trade.		Total.
	Entering.	*American.*	*Foreign.*	
1855	1,675	1,073	2,071	4,819
1856	1,504	1,055	2,033	4,592
1857	1,440	1,059	1,953	4,452
1858	1,181	930	1,963	4,074
1859	1,271	983	2,092	4,346
1860	1,252	927	2,190	4,369
1861	1,263	1,045	2,357	4,665
1862	762	992	1,724	3,578
1863	972	836	2,170	3,978
1864	704	602	2,631	3,937
1865	1,072	607	2,401	4,080
1866	1,855	566	2,644	5,065
1867	1,378	587	2,165	4,130

These tables do not include the number of vessels arriving that did not enter at the custom-house, and in this are deficient.

The same volume, (p. 161,) however, gives the whole number of coastwise vessels, both entering and not entering, for the period of three years, when the commerce of Boston was in this respect apparently equal to what it has been at any time since.

Taking the largest number of such arrivals ever reported by the board for any year, merely as a probable estimate, and adding it to the above table, and we show the following result for the whole number of arrivals, viz: in 1855, 8,489; 1856, 8,262; 1857, 8,122; 1858, 7,744; 1859, 8,016; 1860, 8,039; 1861, 8,335; 1862, 7,248; 1863, 7,548; 1864, 7,607; 1865, 7,750; 1866, 8,730; 1867, 7,800.

And these, Mr. Chairman and gentlemen, are the usual authentic, established statistics of Boston commerce, collected for the unimpassioned, unequivocating purposes of commercial records and commercial knowledge only.

But as this consideration is vital to the issues here, and now by you under hearing, and has been made vital, you will allow me to corroborate it by testimony from a third and entirely independent source, of the highest value that the nature of the case permits.

The Boston shipping list of January 1, 1868, contains a résumé of *all* the vessels arriving at this port for the 10 years next preceding, made up from *actual personal observation and count*, as by reference to the ——— of ——— will appear. That résumé is as follows:

Year.	ARRIVALS FROM FOREIGN PORTS.					Coastwise.	Total.
	Ships.	Barks.	Brigs.	Schooners.	Total.		
1858	171	324	764	1,488	2,747	6,354	9,101
1859	248	381	814	1,619	3,089	8,415	11,504
1860	187	359	866	1,879	3,291	8,892	12,183
1861	187	301	713	1,547	2,838	6,741	9,579
1862	191	309	694	1,807	3,001	6,273	9,274
1863	119	343	645	1,932	3,039	6,927	9,966
1864	114	391	698	1,734	2,937	6,217	9,154
1865	86	360	711	1,982	3,139	5,866	9,005
1866	117	406	759	1,507	2,789	6,310	9,099
1867	133	386	707	1,397	2,623	6,127	8,750

The evidence from these three independent sources, fairly adjusting the elements of doubt in the first and second, as you please, determine to all reasonable certainty that the whole number of vessels entering the whole harbor of Boston has not for some years exceeded 10,000 vessels per year, all told. The best and most reliable evidence the case admits makes the number for 1867 considerably below that figure. Ten thousand vessels per year is to be taken then as a settled fact. Of these, says the harbor-master and collector, Russell, (and we concede it for the argument here,) one-half, that is 5,000, pass above the bridge. In other words, instead of 32,972 passages yearly through the draw of the proposed bridge the number so passing will not exceed in any year 10,000.

General Foster again says five minutes are necessary for opening draw and passing a vessel, and makes his calculation of the aggregate time upon that basis. The evidence upon this matter is as follows:

Mr. S. S. Post, an engineer of great repute, testified that the draw of his plan, which is identical with that of Mr. Pratt, could be opened and shut by hand-power in from two and one-half to three minutes at the outside, as a regular thing, and in considerably less time if moved by steam.

Honorable Chester W. Chapin, president of the Boston and Albany railroad, testified that the draw of the Albany bridge, 110 feet in the clear, each side, was actually opened and shut in two and one-half minutes on an average on all ordinary occasions, and by hand.

Mr. T. W. Green, superintendent of the Albany railroad and bridge, testified that the same was opened and shut by hand, regularly, in two and one-half minutes.

The sworn testimony of all the persons employed by the Boston and Albany railroad to work the draw, and as watchmen, &c., (which affidavits or copies thereof accompany this statement,) was that on one of the most unfavorable days for working the draw the time of opening and shutting the draw, vessels passing both sides of the draw at the same time, and passing several at a time, was, on the average, three minutes and eight seconds, for the entire day, and the lowest time two minutes.

Mr. E. S. Cherbrough testifies that the Chicago bridges open and shut, and travel is resumed, in two and one-half minutes, "all in order."

Mr. Curran testifies that the India Point bridge is opened and shut, also, within two and one-half minutes.

Mr. Edward Frost, civil engineer of this city, and recently employed upon the harbor, states that the draw of the bridge can be opened and shut, and travel resumed, in two minutes by steam.

Mr. T. Willis Pratt, who has constructed draws upon this plan, and knows their capacities, states that it can be so opened and shut, and travel resumed, in two and one-half minutes by hand-power, and by steam in about two minutes.

Mr. Curtis and Messrs. McKay & Alders, two of the largest constructors of steam engines in this vicinity, and both practically conversant with their working facility, state that two minutes is time sufficient for working this draw. Other witnesses have testified to this same fact, and the statements of most of the afore-named gentlemen accompanying this paper.

The draws of the bridges from which General Foster and others take their data of time, are draws of older construction, placed at all disadvantageous positions respecting currents, and not much if any exceeding 30 feet in width, little wider than ordinary vessels, and, in short, resembles the draw of the proposed bridge about as much as a 40-ton-yacht resembles the Dictator; and even at these draws an average of only five minutes is claimed.

The problem then is reduced to this:

Number of vessels passing singly, 10,000; time of passing as by the testimony not exceeding, at each passage, three minutes; whole time of passing for a year, during which land travel will be detained, 30,000 minutes; 30,000 minutes equals 500 hours, and that is a detention of 1 *hour and* 22½ minutes a day, and this the maximum as we claim. Upon basis of General Foster's time, 50,000 minutes or 833¼ hours of detention will result per year, or a daily detention of 2 *hours and* 17 *minutes.*

The present detention over the ferries to land travel is over 13 hours per day, that is so much time when persons and teams cannot proceed. Thus, upon General Foster's time, the gain of time between the different parts of the city and to general land transit and commerce will be over 10 *hours* every day by the proposed bridge.

4. Respecting the fielding of ice, the testimony of the pilots and of the harbor master of Boston, one of whose peculiar duties it is to clear the harbor of ice, (the evidence is herewith placed in your hands,) is that the additional facilities provided by the bridge will be fully equal to keeping the harbor clear at all times from this impediment.

This testimony, from gentlemen personally and practically conversant with the matter of which they speak, outweighs a multitude of random, loose opinions of gentlemen who have spoken here upon their hopes as well as their fears.

5. The anchorage ground of the harbor has been clearly stated by the harbor master, Mr. Gardner, for the distance of 3,000 feet north and

south in the direction of the current, all anchoring of vessels, except *one* large vessel, is by law prohibited.

General Foster, the Board of Trade, Professor Pierce and other gentlemen, seem to have considered this whole area as open and free to anchor vessels in, and their estimates and statements proceed on that conception

It is plain they are laboring under a mistake in this matter; anchorage is there prohibited, and let it be observed, is prohibited chiefly by the obstruction to the harbor arising from the two lines of ferries continually traversing this area—the harbor master says this explicitly.

This entire area, 3,000 feet in length and extending from shore to shore, is of the deepest water, and in capacity among the finest and best anchorage of the harbor; but it is not now available—is not now used except for *one* ship—has not been used for more than a quarter of a century.

Another proposition is admitted and is proved by the facts stated, viz: that a vessel can anchor as near the proposed bridge as it can the axis of the ferry path, so that if the bridge were placed at the People's ferry a vessel can anchor as *near to it* as it is now permitted to anchor near the ferry line.

The mathematical statement of the anchorage question is this: a given area of anchorage water, equal and the same area obstructed and prohibited to anchorage; remove all obstructions, and whole area will be free; remove obstructions for 2,500 feet in line north and south, and 2,500 feet north and south becomes unobstructed and restored to this use of commerce. In other words, place the bridge at the People's ferry; let 500 feet next south remain closed to anchorage, as it is now closed, and you remove the East Boston ferry, (that is the obstruction which has shut off the remaining 2,500 feet,) and this 2,500 feet becomes then free and clear, redeemed to this use of commerce.

The proposition of our opponents reduces itself to this absurdity: a given area, and all the same obstructed; remove the obstructions, (that is less four-fifths the obstructions,) obstructed area greater than at first.

The uniform testimony of the pilots—that by the bridge the "*available anchorage*" is increased—is therefore true as a matter of strict science, as well as of popular observation and practical experience.

The amount of anchorage ground added, in terms of square feet, will be 2,500 feet in length, by an average width of at least 1,800 feet, or 4,500,000 *square feet.*

To follow each groundless statement that has been made before this commission—in some cases iterated and reiterated—would require a volume to be written. A single statement made by Professor Benj. Peirce to Congress, and repeated substantially to this commission, deserves a moment's attention, both for itself and as an example of the unguarded and reckless statements that have got hearing and credence, it would seem, on this matter, in the absence of all the usual tests of ascertaining truth. Professor Peirce, speaking of the injury to the harbor by the bridges now existing, says:

> It would be cruel to add a new destroying agent of this kind, (the Maverick bridge,) worse than all the others put together.

The Maverick bridge has three, and only three, piers, constructed and to be placed according to the rules laid down by the engineers of the United States and published in their reports. It is built with bays from 600 to 800 feet in length, in which the water is entirely without obstruction.

Of this bridge Mr. Herschel, in his statement, put in by the opposition, says:

> With a proper construction of piers, and ample distances between them—in other words, by leaving the waterway undiminished, and which it would be the duty of the mayor and aldermen to require—no *danger* need be apprehended that this bridge will result in any detriment to the harbor.

The testimony on this point is substantially uniform with that of Mr. Herschel.

Of the other bridges Mr. Henry Mitchell says that, "although in one sense constants of obstruction," they "*vary so materially* the *physical constitution* of the tide that the original *type forms disappear*, or at least become so indistinct as scarcely to be traced. Each pile," and there are 11,400 of them, "by breaking the continuity, prevents or disturbs transmission of motion by impact, especially at the time when each particle is traversing the most rapid part of the tidal eclipse. Each bridge appears to be constructed independently of the others, so that, as a whole, they *present a forest of piles driven in hit or miss* as regards the tidal path, with their girders, string-pieces, and tie-beams lying at every *conceivable angle with the bewildered stream*. Motion of transmission gives place to running water, and running water *is checked and dammed* so frequently that it goes whirling about, gathering muds, which it may not relinquish till it reaches some sheltered cove or spreads out with exhausted strength upon the harbor below."

This is one of the descriptions given by that distinguished engineer, Mr. Mitchell, of the deleterious effects of these seven or eight bridges.

Is there any truth—the least, a scintilla of truth, even—for the bald, naked assertion of Professor Benj. Peirce, that a bridge with only three piers, and these scientifically constructed and located, having clear bays of 800 feet in width, is "*worse than all the others put together?*"

And yet, so far as that distinguished scholar and mathematician is concerned, he allows himself to give the authority of his great name to this, as it seems to us, reckless, unsupported, unjust statement.

Important, vital interests, public and private, are at issue in the question of this bridge. Where shall we find truth, candor, right, in the midst of such statements?

There are other statements before this commission equally groundless with this, supported by many names, echoed in many mouths; which, for the reasons I have urged, cannot be met and answered here.

It has been said that three-fourths of the wharves of the harbor are situated above the line of the proposed bridge. A more specious and deceptive statement could not well have been made.

There are but two wharves above the line of this bridge at which large vessels engaged in general commerce habitually dock.

Besides, one of the very objects and purpose of this bridge is to open and make available to commerce, as connected with railways, that long line of wharves on the deepest water of the harbor—from the Cunard wharf southward—a connection of commerce which cannot be effected in any other part of the present harbor of Boston.

It is impossible in the mode and limitations of this hearing to expose all the statements that have been made, and the commission must feel their way through them as best they may.

Private interests—owners of ferries, owners and presidents of wharf corporations, contractors for filling flats, parties measuring public improvements—through the glass of pecuniary profits, have used the instruments of their intelligence and power, being subject neither to the test of an oath, nor to the searching inquisition of a cross-examination,

to pour upon your commission a mass of material, as unsatisfactory to the honest seeker after truth as it is immense.

We are told by General Foster that at "some critical moment a secret enemy in our midst may blow the draw of this bridge into the stream" and "jeopardize the loss of a fleet, or the safety of a city from bombardment," and, therefore, this bridge should not be suffered by the United States government.

On the basis of this reasoning every advance in society becomes a petrefaction. Do you propose to build a fort in your harbor, or even to man and equip a frigate for service upon the sea? Some secret enemy in our midst may, with his wicked compeers, just at the critical moment, seize the fort or the frigate, overpower the garrison and the crew, and turn the guns of each upon a then defenceless city. Therefore, we will oppose the fort, and oppose the frigate; the United States government shall interpose its injunction.

It has been said from another eminent quarter, as one of the great lessons of history, that the civilization of a country is exactly measured by the extent of its mercantile marine, by its sea commerce.

Of the old and *effete* civilizations of history, this dogma may to a great degree be true, but the civilization of this broad country of ours is being printed upon another, newer page of history. The mighty prairies of the west and the huge summits of the rocky Sierras are neither traversed nor developed—the wealth, the industry, the enterprise, the civilization of this country are not developed by the sail or steam vessels of the Mississippi or the Gulf, of the Pacific or Atlantic ports, important as these agencies have been and are, but by the Great Western, Pacific, and other railways, that have become, by modern science, inland rivers of America, more fluent, more capacious, more pervasive, more influential, than the rivers and water-courses of nature.

The Wheeling bridge, fought in the supposed interests of commerce, as this Maverick bridge is fought here and to-day, has justified itself to posterity, and is a monument to the folly of its opponents; for, to-day, the great traffic of that section of the country is not done from Pittsburg down the Ohio, in steamboats whose smoke-stacks rise from 80 to 90 feet in height, but by the rail cars, speeding their way in every direction over that land.

And it may not be amiss to remember at the conclusion of this hearing that it is only a little more than 50 years since that Sir Humphrey Davy, one of the greatest chemists and philosophers of the world, to some enterprising gentlemen who applied to him for his certificate as to the practicability of lighting houses and streets by gas, answered, it is nonsense, absurd nonsense; you can as soon import moonlight and use it for that purpose.

Houses and cities are nevertheless lighted by gas; mankind have survived its introduction; some explosions, indeed, have succeeded; men are to be found who still prefer the tallow candle and the whale oil, but civilization has turned a new leaf, enunciated a new dogma, and advances by the light of gas.

Your commission, as it has been publicly boasted by some of our opponents, may have predetermined the issues discussed here, and our labors may have been a waste, but the future of this city is built with a bridge across its harbor—the map is already printed and in the hands of thinking men—and every step of our harbor progress thus far has been, and in the time to come will be found to have been there laid down.

MAVERICK BRIDGE COMPANY,
By EDWIN WRIGHT, *Attorney.*

[From the New American Encyclopedia.]

Brest is the chief station of the French marine, and one of the first military and naval ports in Europe. Its outer harbor is unsurpassed for safety and is exceeded in extent only by those of Constantinople and Rio Janeiro. It connects with the sea by a single long and narrow passage divided by a rock in its centre, so that vessels are obliged to pass immediately under the batteries. Its inner harbor can contain 60 frigates, and is most strongly fortified.

M. Souchard, French consul at Boston, says: "Brest has hitherto, to within a short time, been only a naval and military station—is not a place of commercial notoriety, but is the great naval yard and storehouse, or port, of France. Her naval works are of immense extent and cost."

Mr. L. Hollingsworth says "he saw the draw opened and some of the largest vessels passing, one draw was opened wide and the other partially; bridge is entirely of iron and an imposing and remarkable work. The land on either side is a steep ascent, and the ends of the bridge rest up the ascent some distance."

He does not recollect the length or the width of the bridge, but thinks it about the same as the Charlestown bridge. There is a bridge below, but he does not recollect about it particularly. He says the government buildings within this harbor are very magnificent and extensive.

Murray's Handbook of France, late edition, has the following:

Brest, the chief naval station of France, a dock-yard and fortress of the first class, is very advantageously situated, &c., &c.

It stands on the north side of one of the finest harbors in the world, nearly land-locked, accessible only through a narrow and well fortified throat (Lè Goulet) one mile wide, divided by a rocky islet (Roche Mignan) in the middle and extending far inland, &c.

The town is built on the summit and sides of a kind of projecting ridge, and some of its streets are too steep to be passable except on foot.

The Penfield debouches into the inner harbor and divides the town on its left bank from the suburb Recouvrance on its right.

The communication between the town and suburb is kept up by an iron swing bridge, the largest swing bridge in the world, 65 feet above high water mark and in two divisions 347 feet long between the piers; it opens in the centre to allow ships of war to pass, and each valve turns on a colossal granite pier and moves by ingenious machinery. It was completed in June, 1861, and is a fine work of engineering.

In the dock yard are three dry docks of the largest dimensions. On one side is the (Voiland,) sail house, (Magasin général.) stores and (Corderie,) rope-walk of three stories, surmounted by the old bagne, and above it rises the new hospital.

On the other side are various ateliers, forgeries, Atelier d'Artillerie de Marine, burnt in 1833.

The foundries and the (Quartier de Marins) or sailors' barracks, where they are lodged when in port in the same manner as soldiers are, fill up the opposite side.

The level space at the water's edge is occupied by slips, (cales de construction,) the ships while building being covered with oil cloth.

Above the slips is the Atelier de Capercius. the government foundry and steam factory for the construction and repair of steam-engines, and surpassing in extent and good arrangement any in Britain; from a square tower connected with it the machinery is lowered into the vessels.

There are beside timber yards, boat sheds, water cisterns, supplied by a steam engine where vessels fill their tanks, shops for constructing tanks and the new government cellar, while a very large space near the sea entrance of the dock yard is covered with dismounted cannon.

The victualling office (Direction de subsistance et Parc aux Vivres) is near the mouth of the port on the right bank and includes the bakehouse, containing 24 ovens, the slaughter-house, kitchens, &c., supplying 50,000 rations daily.

On the Recouvrance side of the Penfield lies the Smithy (usine) de Villeneuve, the iron forges, furnaces and workshops, moved by hydraulic wheels.

The steam engine factory is one of the largest and most complete in Europe, comprising a boiler-house and sheds for the construction and repairs of all parts of a steam engine.

By means of a huge crane the heaviest weights are raised from the quay or lowered down to it

Near the mouth of the Penfield, opposite the chateau, is the victualling yard (Parc aux Vivres) where every sort of provisions for the fleet is prepared or stored, corn warehouses, flour mills, bakeries, cooperage, slaughter-houses and salting-houses.

SUFFOLK, *ss:*

I, John Noble, of Boston, Massachusetts, on oath depose and say: That I am 49 years of age, and by profession a civil engineer; that I am acquainted with Boston harbor by personal observations and experience, and by a detailed and careful study of the various scientific reports of the United States commissioners and advisory board of engineers upon said harbor and the waters confluent thereto, and that I am clearly of the opinion that the erection of a bridge between Boston and East Boston, as limited in plan and details by the act of the legislature of Massachusetts incorporating the Maverick Bridge Company, passed June 11, 1868, will not tend in any material degree to the shoaling of the waters of said harbor at any point; that in my judgment it is very doubtful if *any* perceptible shoaling can be produced by a structure of the character proposed, and if there should be any at all it must of necessity be of an exceedingly limited character as to the amount and the duration of the disturbing forces, and would be capable of a direct, speedy, and effectual compensation at only a nominal expense; that the effect of the bridge, as proposed to be built, upon the tidal and river currents and tidal forces is purely a theoratical one, and cannot result in any appreciable damage; that no injurious effects can be apprehended from the influences of this bridge upon the freezing of the harbor, for the present appliances of the harbor, as used by the city of Boston, are abundantly adequate for the complete protection of the harbor in this respect.

JOHN NOBLE.

OCTOBER 5, 1868.

Subscribed and sworn to by the said John Noble before me.

EDWIN WRIGHT,
Justice of the Peace.

SUFFOLK, *ss:*

I, Thomas C. Childs, of Boston, depose and say: That I am 31 years of age; that I have personally investigated the number of vessels at the several wharves in Boston above the line of the proposed bridge, between Boston and East Boston, at the People's ferry, for the period of one year; that the number so obtained were in all cases taken or given to me from the records of the wharfingers, or from the agent or person there in control; that the numbers were so obtained before any excitement on the bridge question had a chance to interfere with such reports, and, as I believe, show the actual number of vessels at the wharves, and the same were as follows, viz:

Whole number of vessels at Boston wharves	2,562
Whole number of vessels at East Boston wharves	1,455
Whole number of vessels at Charlestown, (not including navy yard)	765
Whole number of vessels at Chelsea wharves	379
Total at all said wharves	5,164

I further say that many of these vessels, as I ascertained, were counted at several different wharves in a single instance; nearly one-half of the vessels at a wharf were also at one, and some of them two, other different wharves. I was not requested to ascertain this fact, and did not pursue it.

The above statement I believe to be thoroughly accurate and reliable.

T. C. CHILDS.

Subscribed and sworn to this 3d day of October, A. D. 1868, by the said Childs, before me.

EDWIN WRIGHT,
Justice of the Peace.

A true copy:

GEO. W. EMORY.

Extracts from reports of the United States commissioners on Boston harbor.

Report of 1864, *by Brigadier General Joseph G. Totten, Professor A. D. Bache, and Admiral C. H. Davis.*

We have in another place (second report on Portland harbor, p. 54) fully recognized the unavoidable necessity for bridges and other means of transit in a city situated as Boston is. We should be very far from recommending that the growth and business of the city should be retarded or incommoded by the want of proper means of communication between it and the neighboring country, or by the absence of other improvements. We only insist that in all such cases the public interests be not sacrificed to private or corporate enterprise.

And again:

If it be admitted, and we do not dispute it, that the conveniences of business are to be purchased at a price, and that price a certain degree of injury to the harbor, it must also be admitted that the limits of gain and loss, of advantage and disadvantage, ought to be as nearly balanced as possible.

And again, speaking of the undoubted necessity for new bridges between portions of the city, they say:

We ask that the *new bridges* shall be so built as to insure the *least obstruction to the water-ways;* and besides this we ask that the old bridges be rebuilt under the same conditions, so that the sum total of the impediments be reduced to a minimum.

And again:

We suggest that the *piers* on which the bridges rest should be of *stone* or *iron*, or both combined; and if of stone, in the form of a truncated pyramid, allowing an increase of the water-way with the rise of the tide. This would conform to nature.

And again:

There is no great objection to planting a single row of piles at large intervals across a channel, and the objection, such as it is, must yield to the necessity of the case.

Mr. Henry Mitchell, engineer of the United States Coast Survey, upon a report upon a physical survey of Boston harbor, speaking of the existing bridges and their effects upon tidal heads, &c., says:

If, by constructing these bridges, the angular resistance could be removed, the *number* might safely be increased. Theoretically speaking, the only violence necessarily offered to the flow of a stream by a bridge is a reduction of the water-way.

Report of the United States commissioners, 1866, *the commission consisting of Professor Bache, General Delafield, and Admiral Davis.*

The absolute necessity of bridging them over, and even filling them up to some extent, was so patent in earlier times that the case did not admit of serious question, and every effort in these directions met with encouragement and support, notwithstanding that it threatened a degree of injury, because each in its small way weakened those tidal forces which maintain the ample channels and secure anchorage basins which constituted the excellencies of the harbor.

And we take pains to say that we, ourselves, in our papers on Boston harbor, extending through a period of 20 years, never failed to recognize that this operation was the necessary concomitant of the growth of the city, and, indeed, the very mode of its prosperity and increase. The statesmen and political economists of the day found that their part was to lay the foundation of commercial greatness.

One of the duties that devolve upon us is to preserve and improve the instruments of commerce. We need make no apology for anything we may have to say in the execution of this duty.

* * * With an enterprise as remarkable in its conception as in its faithful successes, she (Boston) has made herself the centre of a magnificent *system of roads, which has in great part supplied the place of rivers for her interior trade.*

* * * In the discussion of the physical derangement occasioned by the bridges, it seems to be shown that it *is not* the *reduction of the cross section*, nor the *displacement of tide-water* that constitutes the most serious charges against these structures, but that the *larger part of their ill effects results from their mode and place of construction.* They each and all oppose unnecessary resistances to the ingress and egress of tide-water by *offering abrupt obstacles, sudden deflections of course*, and diminutions of *water-way*, but not all alike.

A true copy:

E. WRIGHT.

I, Jacob K. Lunt, of Boston, Massachusetts, depose and say, that I am 58 years of age; that I am now, and have been for the last 35 years, a pilot, carrying ships in and out of Boston harbor, and for the last 28 years have been a commissioned pilot in said harbor, and have had personal charge of more than 5,000 vessels; that I am conversant with all the facts respecting the Maverick bridge, having examined the plans and heard the testimony on both sides; that such a bridge would be a great advantage to the harbor of Boston, over the ferries; that the obstruction created by the two lines of ferries to navigation and to anchorage is very much greater than that arising from the bridge; that the space or part of the harbor required to be kept clear for the ferries is from two to three times what would be required for the bridge, and that this amount of available space would be added to the available anchorage ground by the construction of a bridge and the consequent removal of the ferry lines; that any ship, however large or heavily laden, can be carried through the draw of the proposed bridge with as much ease and safety as she can now be carried up and down the channel among the ferry-boats, and with much more safety and security than they can be put into the dock; that I have often myself, both in the day-time and at night, run the large Cunard steamers into their slips, across the tide, without even having encountered any accident; that said ships are very much narrower than the draw of the proposed bridge; that such a bridge would not in my judgment be of any injury to the passing of vessels, either by sail or steam, and would not prove any detriment to the interests of commerce, and that I speak more confidently on this point because I have had considerable experience in passing vessels through draws and through narrow channels, channels narrower than the draw of this bridge; that from the line of the proposed bridge, say at the People's ferry, there extends anchorage nearly or quite one mile and a half to the south thereof, and that within that space there is safe and sufficient room for moving 20 at least of the largest vessels, of navy or mercantile marine; that as respects vessels going to sea from the upper wharves, or any of the wharves above said bridge, there is no difficulty whatever in any number of vessels that could be got ready for sea at those wharves, to be passed down upon a single tide; that the statement that large-sized vessels must start at or near the slack of the tide is not true; that it is customary for such vessels to start at any period between

half flood to half ebb tide, and has been so during my whole experience; that within a few years a great change has taken place in the moving of vessels. At present almost all large vessels are taken up and down the harbor, and to and from their wharves, by steam tugs, and are in the easy and complete control of those tugs.

There is no doubt in my mind but that the tug-boat required to be kept at the bridge would prevent all damage from ice, and would keep the outward flow of the same as free as it is at the present.

JACOB K. LUNT.

SUFFOLK, *October* 5, 1868.

Subscribed and sworn to before me.

EDWIN HEIGHT,
Justice of the Peace.

I, John T. Gardner, of Boston, depose and say, that I am 53 years of age; that I have filled the office of harbor-master of the city of Boston for the period of eight years; that my duties as harbor-master are to regulate the anchorage of vessels and look after any obstruction from ice, wrecks, floating timber, or other cause, in the said harbor; that the anchorage ground in Boston harbor, as regulated by the ordinances of said city, is limited as follows: except as hereinafter stated, no vessel is permitted to anchor north of a line drawn from Cunard wharf in East Boston to India wharf in Boston. This limitation is, as I understand, chiefly on account of the obstruction to the harbor created by the passage and the swing of the two lines of ferry-boats. North of the said line, anchorage is allowed as follows: *one, and only one large ship* to be anchored between the ferry lines, and a limited anchorage space above the People's ferry and east of the Chelsea ferry line, around the East Boston or Miller's Point, at the discretion of the harbor-master. This latter is popularly known as "Miller's Point anchorage." In respect of ice, whenever in the winter season it has been necessary, I, as harbor-master, have employed, from time to time, one or more steam-tugs to assist in keeping the ice in motion out of the harbor, and the harbor clear. An additional tug-boat would be sufficient, I should think, *to equal, at least*, any additional obstructions to the flow of ice which might arise from a bridge with three piers as proposed.

JOHN T. GARDNER.

BOSTON, *September* 29, 1868.

Extracts from reports of committees of the city government of Boston, respecting the opportunities and demands for increased commercial facilities at East Boston.

Report of Joint Special Committee, of which the Hon. Ebenezer Atkins was chairman.

JUNE 13, 1859.

The committee deem it unnecessary to enlarge upon the immense advantages to Boston which arise from the extensive commercial, manufacturing, and mechanical interests which have found an abiding place at East Boston, and which the existence of deep water around its ample wharves will probably render permanent in that locality.

Report of Joint Special Committee.

JULY 13, 1863.

Ward 2 (now ward 1, East Boston) is a portion of the city which is peculiarly adapted for a large mechanical and commercial business, situated in deep and abundant water; also large tracts of elevated land for residences, possessing advantages equal if not surpassing any other ward of the city.

And again:

It is the uncertainty which hangs over the East Boston ferries that prevents the location of manufacturing establishments in ward 2, which would bring in a very large amount of taxable property into the city of Boston, but which for these facilities goes to other States and other cities.

Report of Committee on Streets of the Board of Mayor and Aldermen, of which Ex-Mayor Joseph M. Wightman was chairman.

DECEMBER 20, 1858.

The committee say: The petitioners for avenues represented "an array of names, which for wealth, respectability, and influence is rarely presented in favor of any project," most of whom are not residents of East Boston, but, they say, persons who "have a deep interest in the extensive business connected with manufactures and shipping for which East Boston is so admirably adapted. The value of this section of the city to the commerce and business of Boston can hardly be realized."

And again:

The water front of East Boston is five and one-eighth miles. Of this but seven-eighths of a mile is obstructed, and only by a single bridge, while more than two and a half miles is on Boston harbor, with a deep-water channel, and wharves where vessels of the largest class can lie and load. For commercial, manufacturing, and mechanical purposes there is probably no place in this country that possesses greater advantages than East Boston.

Report of a Joint Special Committee of which the Hon. Thomas C. Amory, jr., was chairman.

NOVEMBER 22, 1860.

It needs no gift of prophecy to predict a brilliant future for East Boston. Its water front of five miles and a half around the island, extends two on the principal channel of the harbor, which is always kept free from deposits by the rapid current from Charles and Mystic rivers. At its wharves are laid an increasing proportion of our largest merchantmen, and the cheapness of its warehouses, and the facility of transportation by water and the Grand Junction railroad, give it many advantages over the city proper, for our foreign trade

Report of a committee of the Board of Aldermen, Hon. E. F. Porter, chairman.

MAY 29, 1865.

We believe such another instance cannot be found on the continent, that 25,000 people, with all their trade and business, are subjected to such straits, and are made liable to such dangers in passing from one section of the same municipality to another. It is to be remembered that not only is East Boston, in its local interest and development, hindered and greatly retarded, but an important part of the deep water frontage for large class vessels, and storage for large quantities of heavy goods and merchandise, is rendered quite objectionable, and in some sense unavailable, by the detention and consequent expense of crossing the ferry.

A true copy. Attest:

E. WRIGHT.

Copy of a deposition made by Charles H. Corey, relative to the passage of the Hudson River drawbridge.

STATE OF NEW YORK, *City and County of Albany, ss.:*

Charles H. Corey, being duly sworn, doth depose and say that he is now, and has been for many years last past, a resident of Albany, in the State of New York, and has been employed as captain and in other capacities upon the Hudson river, at and near the city of Albany, during the 22 years last past, and is thoroughly familiar with the same during all the said 22 years; that he is now, and has been at all times since the completion of the bridge at Albany over the Hudson river, employed as captain of the tug-boat used by the said bridge company to tow vessels through the draw of said bridge; that vessels of any and all sizes pass through the said draw at any and all hours of

the day and night; that vessels of all kinds make no alteration in their rate of speed in approaching, going through, or leaving said draw, except that the large river steamers like the Vanderbilt and Connecticut, with a breadth of beam of from 70 to 80 feet, slack headway when approaching the draw obliquely until they get pointed for the draw, and then increase their speed and go through on full head, (for a vessel has better steerage the faster she goes.)

And deponent further says, that the carrying business upon the Hudson river at, above, and below the said bridge has increased since the said bridge was built, and that a large quantity of the lumber business which was done below the location of the said bridge before it was built is now done above the same, and the lumber shipped down the river through the draw to New York and elsewhere; that the signals indicating the opening of the draw are placed frequently some time before the draw is opened, and remain up minutes after the draw is in place again, except when trains are due; that at all other times (except when railroad trains are due) the work is done leisurely, and that the time the signals are up is no indication of the time actually needed or occupied in opening and closing the draw and passing vessels through, and that at many times the draw is left open for five or six passages of different boats when no trains are due.

CHAS. H. COREY.

Sworn to before me this 25th day of April, 1868.

G. L. STEDMAN,
Commissioner of Deeds.

ALBANY, ——, and five cent stamp.

A true copy. Attest:

E. WRIGHT.

Extracts from reports of commissioners of Massachusetts on Boston harbor, stating the principles governing the regimen of the harbor in view of public improvements.

Report of commission December 28, 1839, by General H. A. S. Dearborn, Hon. James F. Baldwin, and Caleb Eddy, civil engineers.

But such is the imperiously increasing demand for greater accommodations by all the infinitely varied industry in which the accumulating population of the metropolis is employed, that it is impossible to meet it without yielding much of mere theory to the practical advantages which will be gained from the increased facilities which such encroachments are intended to afford. It is as true in relation to commercial emporiums as of nations, that they cannot remain stationary; they must advance or retrograde in population, affluence, consequence, and grandeur; and these latter glorious results are dependent upon the active industry, intelligence, and enterprise of the former; and as the continual enlargement of maritime cities is alternately the happy cause and admirable effect of their own and their country's prosperity, whatever can be accomplished that shall tend to produce such triumphant consequences it is the dictate of wisdom to attempt; and if unfortunately any of the anticipated injurious effects upon the capacity of Boston harbor should be experienced from any prospective reclamations which may be made from its domains, it is highly probable that the immense advantages which will have been thus derived will warrant the experiment and justify the expenditures which may thereby be rendered necessary to obviate or remove every impediment which such encroachments may have produced to the free navigation of the various channels by the usual artificial means which have been resorted to in other ages and nations; for it would not be considered an enlightened and patriotic policy to establish the limits of a flourishing commercial capital beyond which it should not be enlarged, from a presumed apprehension that injury in some unknown manner might possibly be thus done to the natural features of its harbor.

Report of commission composed of Messrs. John M. Williams, David Cummings, Thomas Hopkinson, George S. Boutwell, and Charles Hudson, 1850.

The prospective growth of our inland trade makes it highly important that improvements be made in every part of the harbor which will facilitate that valuable part of our trade.

Remark.—The long frontage of deep water wharves on the East Boston side of the harbor have remained to this day unoccupied because, though within 2,000 feet of the centre of commercial business, the access to them has been so bad, uncertain, tedious, and expensive, they have been practically unavailable.

Lieutenant Charles H. Davis, of the United States navy, in a paper among the memoirs of the American Academy of Arts and Sciences, speaking of Boston harbor, says:

The statesmen and political economists of the day would not have hesitated to sanction and encourage the schemes of aggrandizement of enterprising and sagacious projectors, even if they had foreseen that one of these results would be the loss of water capacity in the main channels of the harbor.

A true copy:

E. WRIGHT.

Copy of a memorial to Congress in favor of Maverick bridge by the merchants and leading business men of Boston and the city government of Chelsea.

To the honorable the Senate and House of Representatives of the United States of America in Congress assembled:

Respectfully represent the undersigned, that we have examined and are conversant with the plan and purposes of the Maverick Bridge Company for the construction of a bridge between Boston and East Boston.

That in our opinion, (independent of any local advantage to this city or commonwealth,) in the present enlargement of commercial interests at the port of Boston, and in view of the pressing demand for the direct communication of western freight with the ship at deep water for foreign transportation, and for the economy and facility of suitable railway transportation, the bridge proposed by said company is of the greatest value and importance.

That we are satisfied beyond reasonable doubt that the same can be built without appreciable damage to the harbor in any respect, with all needful facility for the passage and management of vessels; and that the same cannot be in any important sense detrimental to the interests of the United States at this port, (if at all, which we doubt,) and that the incorporators are among our most responsible and enterprising citizens, entirely competent and reliable to carry out this great improvement, according to their charter.

We therefore pray that they may have the full and unrestricted authority of Congress to that end.

BOSTON, *June* 25, 1868.

Nath. B. Shurtleff, Mayor of Boston.
Geo. B. Upton.
Isaac Livermore.
Thomas Lamb, Pres't New England Bank.
Edward S. Rand.
Samuel S. Lewis.
Wm. L. Burt, Postmaster, Boston.
George M. Browne, President Eastern Railroad.
National Dock and Warehouse Co., by E. T. Loring, President.
Nathaniel Seaver, Chairman Committee on Bridges, City of Boston.
Benj. James.

Francis Richards.
N. Henry Crafts, City Engineer.
Rufus S. Frost, Mayor of Chelsea and by vote of the Board of Mayor and Aldermen.
Franklin Hare, President Merchants' Bank.
John Demeritt, President Eliot National Bank.
Charles Woodberry, Ex-Alderman City of Boston.
Edward Crane, President National Railroad Trans. Co.
B. E. Bates, President Bank Commerce.
Andrew Pierce, Jr.
D. Waldo Lincoln, V. P. B. and A. R. R.
John P. Ober, Ex-Alderman City of Boston.
Solomon Hovey, President of Mechanics' Mutual Fire Ins. Co.
Quincy A. Shaw.
Hawes & Crowell, Agents American Steamship Co.
W. D. Forbes, President National Bank of Redemption.
Samuel Hall, President Maverick National Bank, Boston.
Jesse Holbrook, Ex-Alderman City of Boston.
Joseph M. Wightman, Ex-Mayor of Boston.
S. G. Rogers, President Firemen's Ins. Co.
Samuel A. Way, Bank of the Metropolis.
Geo. W. Warner, Retired Merchant and Banker.
Geo. G. Field, President Union Mutual Fire Ins. Co.
W. H. Kinsman & Co., Cuban Merchants.
Franklin Snow & Co., Merchants, Prop. of International Steamship Co.
James H. Lunt, President Suffolk Fire Ins. Co.
Clement Willis, Ex-Alderman City of Boston.
Adams' Express Co., J. W. Adams, Superintendent.
Merchants' Union Express Co., S. W. Waldron, Agent.
Geo. N. Jackman, Jr., Ex-Mayor of Newburyport.
McKay & Aldus, Iron Works.
S. T. Sanborn & Co., Pipe Works.
W. H. Bradley, Civil Engineer, Supt. Department Sewers City of Boston.

A true copy:

E. WRIGHT.

Copy of a memorial of the East Boston Land Company to Congress in behalf of Maverick bridge:

To the honorable Senate and House of Representatives in Congress assembled:

Respectfully represent the undersigned that, in their capacity of directors of the East Boston Company, established under the laws of the commonwealth of Massachusetts, to hold, improve, and sell land at East Boston, in said commonwealth, they feel great interest in the proposed construction of a bridge across a portion of Boston harbor to connect said East Boston with the city of Boston proper; that they believe the proposed bridge will be of great benefit to the lands they hold for sale, by increasing the usefulness of the long frontage of East Boston on deep water for commercial purposes—such having been only partially developed by reason of the want of such bridge communication; that any slight interruption to navigation caused by such bridge would be much more than compensated by the increased facility for transportation of merchandise between the city proper and East Boston; that the commercial interests of Boston would be greatly enhanced by the building of a bridge which would complete the plans, long maturing, for the extension of the most important railroads centering in Boston to tide-

water and direct communication with the shipping in Boston harbor; and finally that, in their opinion, the line of deep-water front still owned by said company, most of which, to the extent of 1,700 feet, is above the proposed location of said bridge, would be increased in working value, rather than injured, by the construction of a bridge in the manner and place proposed.

We therefore pray your honorable body to grant whatever rights may be needed for the erection of said bridge, as being for the public interest.

THOMAS B. HALL,
President East Boston Company.
SILAS PIERCE,
M. D. ROSS,
HAYWARD P. CUSHING,
JOHN PEARCE,
GEORGE N. MACY,
JOHN NOBLE,
Directors.

A true copy. Attest: E. WRIGHT.

I, John McField, of Boston, Massachusetts, depose and say, that I am 60 years of age; that I am now and have been for more than 37 years a pilot for Boston harbor. That I am fully and clearly of the opinion that the erection of a bridge from East Boston to the city proper would be of no serious injury or detriment to the shipping interests of Boston; that a heavily laden ship could be taken through the draw of the bridge without any delay at any state of tide, and in any wind, by the steam-tugs, whenever any prudent ship-owner would consent to move his ship in the harbor or any part of it.

The proposed width of the draw, say 150 feet at least, is not much less than the space between the rocks and spits in the lower part of the harbor, through which the largest ships carrying most valuable cargoes have been taken by the pilots.

The introduction of steam-tugs by which all large ships are moved from the lower light to the wharves, enabling these large ships to be carried through the rocks and narrow passages with perfect safety, (I may say,) would also take a ship of the largest size through the draw of the proposed bridge without any risk or delay.

By the erection of a bridge the obstruction of the two steam ferries would be removed, and the space allotted for the anchorage of shipping could be much increased, as no ships are on the north side of the channel allowed to come to anchor west of the Cunard wharf, nor are vessels allowed to anchor where the ferries are, so that from the British mail steamers' wharf to beyond the Chelsea ferries there is no unobstructed anchorage.

JOHN McFIELD.

SUFFOLK, *ss:*

Then personally appeared the above named John McField, and made oath that the foregoing statement by him subscribed is true, before me.

BENJAMIN BOND,
Justice of the Peace.

APRIL 23, *A. D.* 1868.

BOSTON, *April* 23, 1868.

I have carefully examined the above statement, and fully endorse the same to be substantially correct, in my judgment.

JACOB K. LUNT.
J. L. FOWLER.
H. A. TEWKSBURY.
HENRY L. GURNEY.
ELIJAH BAKER, *Harbor Pilot.*
ROBERT KELLEY.

A true copy. Attest:

E. WRIGHT.

BOSTON, *September* 29, 1868.

I, Moses Whitehouse, of ———, draw-tender at the Charlestown bridge, do hereby certify that the whole number of vessels passing both up and down through said draw for the year 1867 was, as nearly as can be shown, 4,500, or so many passages through the said draw. What I mean to say is that the draw was opened 4,200 times to 4,400 for the passage of vessels, steamers, rafts, scows, and tug-boats, according to my judgment, though no record was accurately kept.

G. P. WHITEHOUSE,
Draw Tender.
M. WHITEHOUSE, *Agent.*

BOSTON, *September* 29, 1868.

I, Adam Bolby, of ———, tender of the south draw of the bridge between Chelsea and Charlestown, do hereby certify that the whole number of vessels passing said draw, both up and down, for the year 1867, was 2,500, and this includes all openings of said draw for vessels.

ADAM BOLBY, *Draw Tender.*

The above statement includes all openings up and down, tugs, schooners, and sail-boats.

WILLIAM H. ARCHER,
Toll Gatherer.

Statement of opening for north draw of Chelsea bridge. Draw opening both ways for all purposes, such as tug-boats, and all classes of vessels.

1867, April	123	1868, April	106
May	179	May	141
June	177	June	124
July	178	July	214
August	159	August	126
September	118	September	100
October	67		
November	73		811
	1,074		

The above statement is from the book kept by me, and which statement I believe to be correct. The whole number of openings during the four winter months of 1867 was not over 100.

WILLIAM H. ARCHER, *Toll Gatherer.*

A true copy:

E. WRIGHT.

PROVIDENCE, *ss:*

I, George Curran, of the city and county of Providence, and State of Rhode Island, of lawful age, on oath declare and say that I am draw-tender of the railroad bridge across Seekonk river at India Point and said city of Providence, and have been since its construction and delivery to the railroad corporation. That I have opened said draw in one minute and twenty-five seconds, and closed the said draw in one minute and nine seconds, and that is the actual time occupied in opening and closing said draw for the passage of vessels this 27th day of April, 1868. The bridge rests upon piles. The first span beginning at the west shore is 113 feet long, the second 108½ feet, the third 154 feet, on the centre of which is the pier upon which the draw rests; the fourth a short span of 20¾ feet, connecting the south end of the draw with the east shore.

GEORGE CURRAN.

I, J. Albert Munroe, of India Point railroad bridge, assistant engineer, on oath declare and say that I was present on the 27th day of April, 1868, at the time of opening the draw on said bridge referred to in the above affidavit, and timed the open and close of the draw, and concur in the foregoing affidavit in all particulars.

J. ALBERT MUNROE.

PROVIDENCE, *ss:*

In Providence this 27th day of April, 1868, personally appeared before me George Curran and J. Albert Munroe, the before-mentioned parties, and made oath to the truth of the facts and statements in said affidavits by them signed.

[SEAL.] JOHN E. RISLEY,
Notary Public.

A true copy. Attest:

GEO. W. EMERY.

Chicago bridges—width of draw—how opened—the number of vessels passed through, and the time required to pass a vessel through these draws.

1. Width of draw? Answer. Various widths, 50 to 90 feet.
2. How opened? Answer. By hand.
3. General time to pass a vessel and travel resumed? Bridge tender says three minutes; has been done in two and one-half minutes, everything in order.
4. Number of vessels passing a day? Answer. Average 100—greatest number through Clark Street bridge; in 1866, in one day 321; in 1867, 263; on the 26th of this month, (April, 1868,) 225.
5. The greatest number passing at one opening? Answer. Nine; time limited by law ten minutes.
6. Average time of openings in a day? Answer. Four minutes.
7. What proportion of openings in which more than one vessel passes at an opening? Answer. Bridge tender reports one-sixth.

E. S. CHESBOROUGH,
City Engineer.

A true copy. Attest:

GEO. W. EMERY.

Extract from a statement by T. Willis Pratt, engineer.

With respect to the draw of the Maverick bridge, the proposition is to move it by steam-power with machinery of the best workmanship and most substantial character, and to move it a full semicircle without suspending its motion when open at 90 degrees—either end of the draw being calculated to make connection with the roadways. These elements being well established and the attendants well drilled to their duties, I have no doubt it may be operated in from two and a half to two minutes.

T. WILLIS PRATT, *Engineer.*

A true copy:

E. WRIGHT.

I, Nelson Curtis, of Boston, depose and say that I am a mechanical engineer, have been engaged in Boston for fifteen years as machinist and constructor of steam engines, of monitors and vessels for the United States, and am the agent of the "Atlantic Works" at Boston; that the draw of the proposed bridge between Boston and East Boston, of the dimensions and general structure proposed by plan and specifications of T. Willis Pratt, can be safely and regularly opened and shut by means of a suitable steam engine, and vessels passed through in an average time of two minutes; that the liabilities to accidents and detentions are exceedingly small, and with the present means of mechanical skill ought not to occur at all.

NELSON CURTIS.

BOSTON, *October* 1, 1868.

We, the undersigned, constructors of marine and stationary and locomotive steam engines, and of monitors and naval vessels for the United States and the governments of South America, hereby depose and say that we regard the above statements of Mr. Curtis as unnecessarily liberal. We have no doubt, as practical machinists, that such a draw can be opened and shut, and vessels passed through and travel resumed as a regular and usual thing in one minute and a half each opening, and that two minutes is sufficient to cover the worst instance of delay that might ordinarily occur. The liabilities to delays by accident of the draw or engine are too small to be worthy of serious consideration. With present mechanical contrivances and precautions such accidents might not occur more than once or twice in several years.

McKAY & ALDUS.

Time of opening and closing the draw to Albany and Boston railroad bridge at Albany, and in vessels and steamers passing through same, between the hours of 7 a. m. and 6 p. m., Friday, April 24, 1868.

No. 1. Steamer with one canal-boat in tow down the river with the current: 1 minute 5 seconds opening draw; 20 seconds passing through; 1 minute closing draw. Total time, 2 minutes 25 seconds.

No. 2. Steamer and barge alongside, with three canal-boats abreast, in tow against the current: 1 minute 6 seconds opening the draw; 1 minute 10 seconds passing through; 1 minute 5 seconds closing draw. Total time, 3 minutes 21 seconds.

No. 3. Tug-boat with steam-dredge in tow against the current: 1 minute opening the draw; 1 minute 20 seconds passing through; 55 seconds closing draw. Total time, 3 minutes 15 seconds.

No. 4. Tug-boat with one schooner and one sloop in tow against the current: 1 minute opening draw; 40 seconds passing through; 1 minute 10 seconds closing draw. Total time, 2 minutes 50 seconds.

No. 5. Tug-boat with sloop in tow against the current at the same time steamer passed down: 1 minute opening draw; 50 seconds passing through; 1 minute 5 seconds closing draw. Total time, 2 minutes 55 seconds.

No. 6. Steamer passed down with the current: 55 seconds opening draw; 40 seconds passing through; 1 minute 5 seconds closing draw. Total time, 2 minutes 40 seconds.

No. 7. Steamer with two canal boats in tow against the current: 1 minute opening draw; 1 minute passing through; 1 minute 5 seconds closing draw. Total time, 3 minutes 5 seconds.

No. 8. Schooner under sail against the current: 1 minute 15 seconds opening draw; 1 minute 10 seconds passing through; 1 minute 5 seconds closing draw. Total time, 3 minutes 30 seconds.

No. 9. Schooner in tow against the current: 1 minute 5 seconds opening draw; 1 minute 20 seconds passing through; 1 minute closing draw. Total time, 3 minutes 25 seconds.

No. 10. Schooner in tow against the current: 1 minute opening draw; 1 minute passing through; 1 minute 35 seconds closing draw. Total time, 3 minutes 35 seconds.

No. 11. Schooner in tow against current: 1 minute 10 seconds opening draw; 1 minute 5 seconds passing through; 1 minute 10 seconds closing draw. Total time, 3 minutes 25 seconds.

No. 12. Tug-boat and four barges abreast and one in tow: 1 minute 20 seconds opening draw; 30 seconds passing through; 1 minute 10 seconds closing draw. Total time, 3 minutes.

No. 13. 1 minute 30 seconds opening draw; 40 seconds passing through; 1 minute 10 seconds closing draw. Total time, 3 minutes 20 second.

The day has been very unfavorable for the above purpose. During the greater portion of the day a strong southerly wind has prevailed, part of the day approaching a gale. This is the worst wind we handle the bridge in.

We, the undersigned, certify that we were present all the time that the above time was being kept, and that it is correct in every particular and respect, and that we were the only persons present.

HENRY M. DUNN.
HENRY F. DUNN.
ROBERT A. DUNN.
AMOS WALKER.
C. B. PLASS.

STATE OF NEW YORK, *City and County of Albany, ss:*

Henry F. Dunn, Robert A. Dunn, Amos Walker, Casper B. Plass, and Henry M. Dunn, being duly sworn says, each for himself, that he is employed by the corporation, crossing and operating the bridge across the Hudson river at Albany, in the State of New York, to open and close and take charge of the draw in said bridge. That he was engaged at the said bridge in his duties as employé, as above stated, on the 24th day of April, 1868, and the times mentioned in the annexed statement signed by these deponents; and that the above statement was made in their presence, and is to the knowledge of each and all of these depo-

nents correct in every particular. That they have, and each one of them has, heard read the annexed statement and all the memoranda therein, and that the same is true in each and every part.

HENRY M. DUNN.
HENRY F. DUNN.
ROBERT A. DUNN.
AMOS WALKER.
C. B. PLASS.

Sworn to before me this 25th day of April, 1868.

G. L. STEADMAN,
Commissioner of Deeds, Albany.

STATE OF NEW YORK, *City and County of Albany, ss:*

Charles H. Cory, being duly sworn, doth depose and say that he is now and has been for many years last passed a resident of Albany, in the State of New York, and has been employed as captain and in other capacities upon the Hudson river at and near the city of Albany during the 22 years last passed, and is thoroughly familiar with the business there carried on at the present time, and has been familiar with the same during all the said 22 years; that he is now, and has been at all times since the completion of the bridge at Albany over the Hudson river, employed as captain of the tug-boat used by the said company to tow vessels through the draw of said bridge; that vessels of any and all sizes pass through the said draw at any and all hours of the day and night; that vessels of all kinds make no alteration in their rate of speed, approaching, going through, or leaving said draw, except that the large river steamers, like the Vanderbilt and Connecticut, with a breadth of beam of from 70 to 80 feet, slack headway when approaching the draw *obliquely* until they get pointed for the draw, and then increase their speed and go through on full head, for a vessel has better steerage the faster she goes.

And the deponent further says that the carrying business upon the Hudson river at, above, and below the said bridge has increased since the said bridge was built, and that a large quantity of the lumber business which was done below the location of the said bridge before it was built is now done above the same, and the lumber shipped down the river through the draw to New York and elsewhere; that the signals indicating the opening of the draw are placed, frequently, some time before the draw is opened, and remain up minutes after the draw is in place again, except when trains are due; that at all other times (except when railroad trains are due) the work is done leisurely, and the time the signals are up is no indication of the time actually needed or occupied in opening and closing the draw and passing vessels through, and that at many times the draw is left open for five or six passages of different boats when no trains are due.

CHARLES H. CORY.

Sworn to before me this 25th day of April, 1868.

G. L. STEADMAN,
Commissioner of Deeds, Albany.

STATE OF NEW YORK, *City and County of Albany, ss:*

Henry M. Dunn, being duly sworn, says he is now and has been at all times since the opening of the bridge over the Hudson river at Albany, in the State of New York, the foreman in charge of the draw in said bridge, and knows all about the practical working of the same; that he has opened the said draw in *forty seconds*, but that the ordinary time for both opening and closing the said draw is from two minutes to two and one-half minutes; that tows of canal boats frequently pass through said draw which are made up of five boast abreast and four lengths deep, and sometimes as many as thirty boats in one tow pass through together.

That a tow consists of a steamboat drawing or towing canal boats and barges lashed together, three, four or five abreast, and the same number attached to their stern, and so for two, or three, or even four tiers; that canal boats are from 12 to 14 feet broad and from 80 to 110 feet long, and barges are still longer; that the signals at said bridge indicating the opening and closing of said draw give no accurate indication of the time needed or actually consumed in using the said draw, for, except when trains are due, they are placed when a boat or vessel is seen approaching at a distance, and are not removed until some time after it has passed through, and sometimes said signals are left up until two, three, or more different vessels have passed through, when the draw might have been closed and the draw used for the passage of trains within the time; that the said bridge has been opened for railroad use since March 16, 1868; that the following statistics and memoranda in regard to said draw are correct. Length of draw 262 feet—two openings of 110 feet each—width of floor of bridge 22 feet. Fifty passenger trains pass over daily, as many as 36 freight trains and 80 engines, and also empty trains. We have an aggregate of 160 trains of all kinds daily.

HENRY M. DUNN.

Sworn to before me this 25th day of April, 1868.

G. L. STEADMAN,
Commissioner of Deeds, Albany.

A true copy. Attest:

GEO. W. EMERY.

Copy of communication forwarded from merchants of Albany respecting commercial advantages of bridge.

ALBANY, *April* 25, 1868.

The Hudson river bridge, at Albany, was erected after great opposition from various interests connected with the navigation of the river, and owners of property above its supposed location.

The bridge was built, and, as far as we know, no interest in the navigation of the river, or the property in its locality, has been injuriously affected.

One bridge was originally authorized to be constructed over the river at the centre of the city. For supposed reasons of policy connected with the material interests of the city, it was required to be erected near its northern limits, and it was so erected. It has not injuriously affected the value of property or the transaction of business either above or below its point of erection.

So far from regarding the bridge as any obstruction to commerce, or

of any detriment to the commercial interests of Albany, or any other locality, it is now proposed to have a new bridge over the river from the very centre and heart of the city.

In that end an act of the legislature has been applied for and is now passed.

The draw of the bridge operated by hand-power affords all needful facilities for vessels on the river going in either direction.

A. E. Gifford & Co.	Thomas W. Olcott.
Smith, Lansing & Co.	Thomas Olcott.
G. A. Woolverton & Co.	Frank Chamberlain.
Daniel Wiedman & Co.	Wm. S. Preston.
Anable & Rogers.	M. W. Bender.
Monteath, Son & Co.	S. B. Congdon & Co.
Friend Humphrey & Sons.	Wm. F. Irwin.
D. W. Regna & Co.	Robt. Higgins.
Isaac A. Chapman & Co.	H. B. Loucks.
Crook, Palmer & Co.	Waterman & Buell.
Ainsworth & Northrop.	Samuel Rankin.
Wilson, Lansing & Co.	J. N. Ring.
G. & E. C. Batchelder.	D. H. Glazier.
Wm. Tillinghast & Co.	A. A. Dunlop.
John Tracey & Co.	Henry Lansing.
L. Pruyn & Son.	R. W. Thacher.
Allen & Curtis.	Jno. Lane.
S. H. Ranson & Co.	J. N. Keeler.
Van Heuson & Charles.	Buckley & Wells.

A true copy. Attest:

E. WRIGHT.

Statement of Edward Frost, civil engineer of Boston, October 7, 1868.

Having testified last winter before the joint committee on harbors of the State legislature, and since that time, and continuously down to the present having reviewed and extended my studies of the harbor and examinations of the proposed Maverick bridge as an engineering question, I find abundant confirmations of all the following matter, to wit:

In the first place, no necessary concomitant damage to the harbor currents has been or can be shown. I am aware that a statement is before the commission now sitting, to the effect that the currents will be *somewhat* accelerated; in the original language, "probably *not over* $\frac{4}{10}$ mile per hour." This statement is entirely unsusceptible of contradiction, however microscopically small the increment. Another and bolder statement alleges a positive increase of $\frac{4}{10}$ mile per hour by computation. This result I hold to be utterly incredible and impossible.

It is known that the present maximum current of ebb is one mile per hour, and that on the flood $\frac{54}{100}$ mile per hour. We may admit, as an extreme possibility, resulting increments of $\frac{8}{100}$ and $\frac{4}{100}$ on each respectively. With this increase in average mean velocity, the bays or waterways would carry all the water that now passes.

Next to be considered is the scouring effect and possible consequent shoaling; where this last will occur, and to what extent.

Scour is a natural effect of accelerations of currents, and while it continues tends constantly, by enlarging the flowing section, to their abatement.

The scour would undoubtedly very soon cease, and the channels and currents would come under a permanent regimen.

The disturbed material would settle down, "by a law as irresistible as gravitation," just where the transporting power of the current failed; it is not determinable by anything better than blind guessing where it would ultimately rest.

Its volume could of course be definitely ascertained by soundings at the bridge site; and an equivalent amount removed by dredging—say at the upper middle—would more than compensate this damage, vaguely denounced as "irreparable."

No trouble is involved in not being able to predict the exact place of deposit; much of it would fall in deep water, where it would be harmless for a long time—perhaps forever.

With or without this bridge it is quite indisputable that ordinary means will always clear the upper harbor of ice, so long as the lower harbor is open. To say otherwise is, in my opinion, an exaggeration, which amounts to an inaccuracy.

The proposed bridge will occupy no part of the space for anchorage now permitted to vessels under harbor regulations and city ordinances. It must, in any case, occupy less of the *possible* anchorage ground than a single line of ferry-boats.

A vessel would incur no greater peril of collision in passing the draw than in entering a *slip* 160 feet width. It would be even more safely accomplished; going through the draw she would be in the thread of the current, and entering the slip she must run across it. In making her way up through a crowded harbor full of vessels at anchor and under way, her risks of collision would be at least as great from Boston light, all the way up, as in passing the draw.

That the bridge would, as compared with open water, obstruct the transit of vessels by confining it to the draw-way, is sufficiently obvious. Also, that the unavoidable impediments would not be unreasonable, and would be quite inappreciable as an element of the cost of export, import, or coastwise traffic.

That the best natural water front in the harbor is the southerly part of the East Boston shore, hitherto undeveloped by reason of the poor facilities for reaching it from the city.

And that the traditional importance of unobstructed water-ways has been exaggerated; and the importance to commerce of the land communications has been underrated.

Considerations outside of the foregoing, being but local, are by inference, and, as I understand, by express ruling of the commission now sitting, not to be weighed by them.

Very respectfully submitted.

EDWARD FROST,
Civil Engineer.

OFFICE OF CITY ENGINEER,
Boston, October 7, 1868.

Having read carefully the preceding statement of Mr. Frost, I hereby state that I fully coincide with the views therein expressed.

N. HENRY CRAFTS,
City Engineer.

Z 8.

From Colonel E. B. Talcott, chief engineer of Chicago and Northwestern railroads, concerning draw at Clinton, Iowa.

DEAR SIR: Your favor of 26th September duly received, and I proceed to reply to your questions in their order:

1st. The draw-bridge over the Mississippi river, at Clinton, Iowa, is built of iron, on the plan known as Bollman's patent. It is a pivot bridge; extreme length 300 feet.

2d. It is a single-track bridge.

3d. The clear water-way, at low-water, for passage of steamboats, is 120 feet.

4th. The draw is operated by steam power, but is provided with hand gear to be used in case the engine should be out of order.

5th. The usual time for opening or closing the draw is three minutes, but it can be done in two minutes.

6th. During the first season after the bridge was in use, steamboats would sometimes lay over on their down trips, when arriving at night or when there was much wind. At that time a suit was pending to remove the bridge as a nuisance, and boatmen were anxious to make out a case. Since the suit has been dismissed I am not aware that any boat has laid by on account of weather or darkness. At night lamps are placed on the long pier, and boats have no difficulty in passing the bridge. I am not aware of a single case of detention to boats because the bridge was not opened in time.

You ask me to state the greatest width of draw, &c. When building the Clinton bridge I collected some facts in regard to drawbridges, but the memorandum has been mislaid, and I would not presume to state from memory. You are, of course, familiar with the law of Congress regulating the construction of bridges over the Mississippi river. In conformity with this law a bridge has been built and brought into use, about the middle of August last, at Burlington, and another is nearly completed at Quincy. The next in order is at Dubuque, which, it is expected, will be ready for use about the 1st of January next. Several others are projected and will soon be built over the Mississippi river.

You say, in the case you are investigating, the company propose to build a pivot drawbridge, with two equal draws of 162 feet, and ask if I think such an extent of draw attainable. I understand you mean 162 feet clear way for passage of vessels. I consider this quite practicable, but would limit the length of a drawbridge to a much less width if I could. I regard the width of draw and fixed spans for Mississippi river bridges as determined by act of Congress to be greater than is necessary to accommodate the navigation. All bridges built subsequent to the law will, of course, conform to its requirements. I am not an advocate of long spans, and would not build them longer than necessary to accommodate the passage of vessels managed with ordinary care and skill. Should you desire more details in regard to Clinton bridge I shall be happy to furnish them.

Respectfully yours,

E. B. TALCOTT.

General J. H. SIMPSON,
Charlestown, Massachusetts.

Z 9.

From Mr. Robert Harris, superintendent Chicago, Burlington and Quincy railroad, about draw at Burlington and Quincy.

CHICAGO, BURLINGTON AND QUINCY RAILROAD COMPANY,
General Superintendent's Office, Chicago, October 3, 1868.

DEAR SIR: The bridges across the Mississippi at Quincy and Burlington are 14 feet wide.

Yours, truly,

ROBERT HARRIS.

General J. H. SIMPSON.

CHICAGO, BURLINGTON AND QUINCY RAILROAD COMPANY,
General Superintendent's Office, Chicago, October 2, 1868.

DEAR SIR: Yours of September 29 is at hand, and I answer your queries in their order:

1st. The draws in the bridges at Burlington and Quincy are both pivot draws.

2d. Double; that is, swinging on the centre, and having passage for vessels on each side; 160 feet in the clear. The total length of the draw is 360 feet.

3d. At present the draw is turned by hand, but we are preparing to turn them by steam. That at Clinton is turned by steam.

4th. The bridge is only for a single track, and is about 18 feet wide. I will give you the measured width in a supplementary note.

Of late years my experience has been solely in operating railroads, and I am consequently not well up as to matters of construction, and therefore have no data from which to answer your questions as to the longest draw in use, or as to the longest practically attainable. I will, however, write my friend W. S. Pope, engineer of the Detroit Bridge and Iron Works, whose experience for several years has brought him more particularly into connection with these matters, and whose opinion would be worth much more than my own.

Using hand power it takes about four minutes to make the necessary preparations, and four minutes to open the Burlington draw.

Using steam it takes three minutes to open the Clinton draw.

There is not the slightest delay to steamers passing up or down. They can be seen for a long time as they approach—many times more than is necessary to open draw.

Respectfully and truly yours,

ROBERT HARRIS.

General J. H. SIMPSON,
Waverley House, Charlestown, Massachusetts.

Z 10

Rear-Admirals S. H. Stringham and Charles H. Bell, and Brevet Brigadier J. H. Simpson, Commissioners, in session at the Charlestown navy yard, to inquire into the effect upon commerce and the navy yard of the proposed Maverick bridge across Boston harbor, &c.

BOSTON, MASSACHUSETTS, *October* 5, 1868.

GENTLEMEN: The dimensions, in part, of the side-wheel steamboat Forrest City, plying between Boston and Portland, are as follows, viz:

Height of smoke-stack above water line, 57 feet; height of working beam, 38 feet above water line; two masts, from 70 to 80 feet in height above the water line.

Respectfully,

JOSEPH GUILFORD,
Second Engineer.

BOSTON, MASSACHUSETTS, *October* 5, 1868.

The dimensions, in part, of the steamer McClellan, of the Baltimore line, is as follows, viz: Height of smoke-stack above the water line, 44 feet 10 inches; height of working beam above water line, 39 feet.

Respectfully,

J. K. McCAUSLAND,
Second Engineer.

BOSTON, MASSACHUSETTS, *October* 5, 1868.

The screw steamer Blackstone (Baltimore line) has a smoke-stack 61 feet in height above the water line; has two masts 90 feet in height above the water line.

Respectfully,

WM. H. JONES,
Chief Engineer.

BOSTON, *October* 6, 1868.

The dimensions, in part, of the ferry-boat John Adams (old ferry line) is as follows, viz: Height of smoke-stack above the water line, 50 feet; height of deck above the water line, 20 feet.

Respectfully,

EDWARD F. BRIGHAM, *Pilot.*

BOSTON, *October* 6, 1868.

The height of smoke-stack of steamboat Metropolis, of the Winnesimmet line, is as follows, viz., from deck to top 31 feet; the centre of the deck is 19 feet above the water line; height of smoke-stack above the water line, 50 feet.

Respectfully,

RUEL W. KINCAID, *Pilot.*

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